

THE IRON AGE

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Equipment for Expediting Shell-Forging

How the Curtis & Co. Mfg. Co., by a Unique Combination of Rollways and Cranes, Doubled Its Plant Capacity for Making Rolled and Cast-Steel Shells

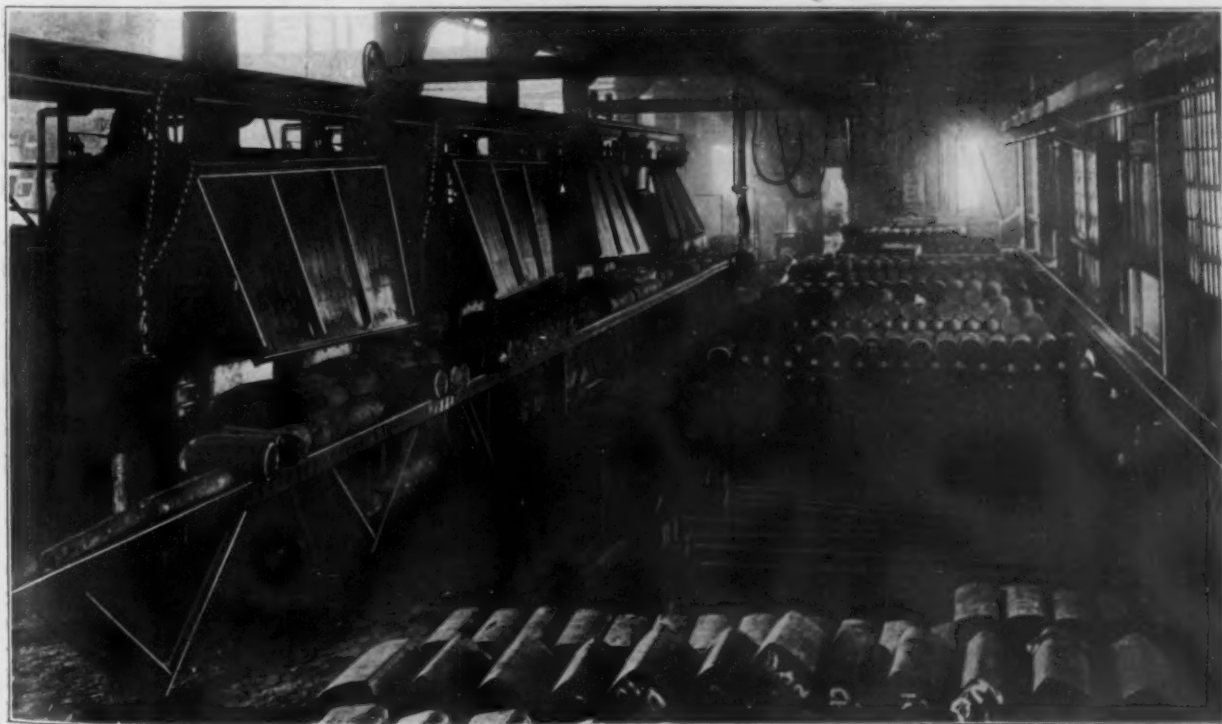
DESIGNED and equipped to establish general efficiency, the two forge-shell plants of Curtis & Co. Mfg. Co., St. Louis, whose process and patented shell-forging press were described in THE IRON AGE of July 5, are of particular interest to engineers as incorporating ideas which have been put in practice within the past year and are applicable to steel works. In no small measure the company's proficiency is due to the successful application of features in steel-handling methods, plant design, heating furnaces, etc., which have added to the ease with which its workmen have done their tasks and speeded up its production.

Rollways constitute an important part of the equipment for handling material, as demonstrated in the original shell-forging plant. What is known as forge plant No. 1 was at first equipped with light overhead travelers to carry the blanks from the furnace to the presses and the forgings away from the presses. Its capacity, with this apparatus, was 600 forgings per day, but experience soon showed that the plant, outside of the conveyor equipment, had a capacity of 1000 forgings a day, and that the overhead carrier system was the only

obstacle to a considerable further increase in capacity. Rollways, therefore, were substituted for overhead carriers, and this enabled adding a fourth furnace, doubling the number of cooling chambers, and increasing the capacity to approximately 2000 8-in. forgings per day, even though one of the original forge presses was removed.

Forge plant No. 2 was designed after plant No. 1 had been in operation for seven months, and the arrangement is considered more efficient than that of the latter. The floor level at the heating furnaces of plant No. 2 is 2 ft. higher than the floor level where the presses are situated, making the application of gravity rolls to the presses very easy. Also, the ground space available for this plant was ample, whereas plant No. 1 was built in a constricted space. The capacity of plant No. 2 in 8-in. forgings is from 2200 to 2600 per day of 20 hr., or in 9.2-in. forgings from 1800 to 2200 per day of 20 hr.

The manner in which the workmen have been protected from excessive heat during the hot summer months in St. Louis is considered by the management to be most successful. In the months of July and August, 1916, the thermometer, for many



Light Overhead Cranes Do All Lifting and Cross-Traveling While Rollways Transfer Blanks Lengthwise of the Shop. Outside the wall are jib cranes which transfer blanks through open windows to the rollway at the right



Ingots Are Moved Lengthwise of the Receiving Platform by a Rollway and Piled by Movable Wall Jib Cranes. Finished forgings are easily rolled from the shipping platform to box cars

days, reached a maximum of 95 to 105 deg., and plant No. 1, which was turning out 1000 forgings a day of 20 hr., did not lose an hour because of shut-downs on account of the heat. A few men whose backs were turned toward the furnaces were prostrated, but when it was discovered that the heat on the spine was the dominant factor in heat prostration the working positions of the men were changed to eliminate this cause.

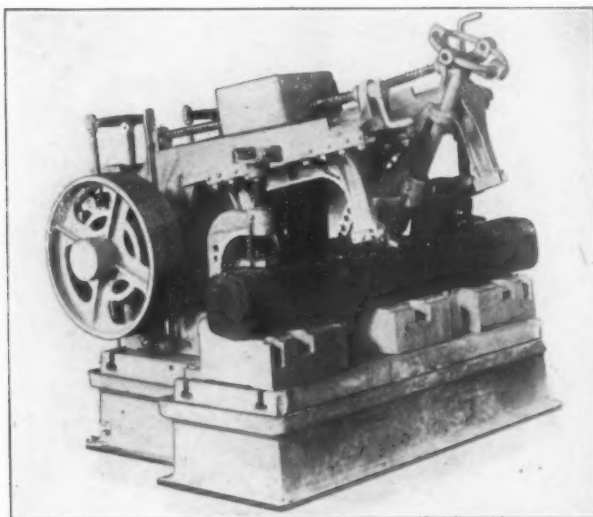
The company believes that the freedom from heat difficulties is due to the combination of the following factors: First, high buildings with removable sides, insuring good ventilation in hot weather, when the sides are removed; second, powerful electric fans sucking in cool air from a shady place and creating a draft toward the furnaces; third, efficient hoods over the furnaces, with ventilators opening in the roof; fourth, water shields front and back of the furnaces; fifth, automatic chain screens in front of the furnaces, which lower as the furnace door opens and are raised as the furnace door closes; sixth, powerful air-blast cur-

tains in front of the furnaces blowing upward and rearward to co-operate with the water shields; seventh, efficient preliminary cooling chambers, so that hot forgings are cooled in brick chambers with good ventilating stacks; eighth, brick or concrete cooling tunnels with good stacks, in which the hot shells from the normalizing furnaces are cooled.

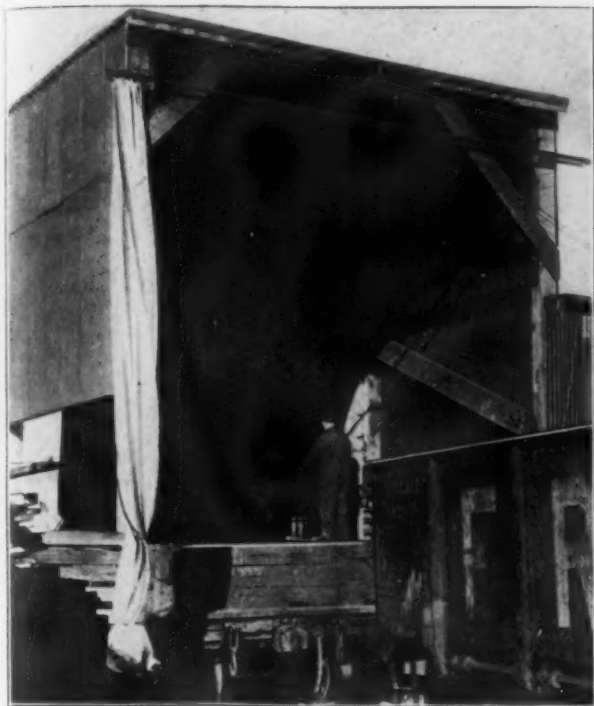
The hydraulic system of each plant is provided with shock absorbers to protect the piping. Also both accumulators are fitted with overtravel control at both ends of travel in addition to being equipped with a centrifugal device which prevents the accumulator lowering at an excessive speed. The company attributes its good fortune in not having had an accident of any kind to the hydraulic piping, to the use of shock absorbers, and the non-use of electrically-driven pumps.

The combination of rollways and overhead carriers, shown in an illustration of the heating furnaces of forge plant No. 2, has proved very efficient for handling the blanks which are to be pre-heated previous to being forged. The blanks ready for heating are piled at the back or receiving end of the furnaces. When these blanks are to be transferred to the furnaces one of the overhead hand-propelled traveling cranes, which carry air hoists and magnets for handling the blanks, is brought over a pile, and remains there while the light, easy-running trolley goes forward and backward from the pile to the rollway until the entire pile has been transferred to the rollway in front of the hearth. The hoists and trolleys, therefore, do the lifting and cross traveling while the ingots move lengthwise of the shop on the rollways.

Ingots are also stored in a receiving shed outside the wall of the furnace building, along the inside of which runs a rollway, shown in the illustration. When these ingots are to be passed to the furnaces they are picked up by the jib cranes on the outside wall, placed on the rollway, and then transferred by the hoist and trolley of the overhead bridge cranes to the rollway in front of the furnace hearths. Also, when a heat of ingots just received is being piled back of the furnaces, the wall jib crane transfers the ingots to the rollway and the



From the Viewpoint of Inspection, Hack-Saws Were Very Satisfactory as They Made Clean, Mirror-like Cuts showing the Slightest Imperfection in the Steel



This Simple Unloading Shed Is Well Protected from the Weather and the Light Tongs of the Air Hoist Have Proven Rapid, Safe and Dependable



Ingots Are Received for Inspection Through Open Windows and Transferred to Either Inspection Table by the Rollway. Inspected ingots are removed by trucks

ingot moves up or down this rollway until opposite the space where the heat is to be piled, and is then picked up by the trolley and the hoist on the bridge crane and piled, the heavy bridge remaining stationary while the light trolley and hoist do all the moving.

The two traveling cranes shown were at first used without the rollway, but their capacity was entirely inadequate, so the two rollways were added. The combination of the rollways and cranes has a capacity far beyond the capacity of the four furnaces. The receiving hearths on these furnaces are 4 ft. deep and extend entirely across the width of the furnaces, and have a large storage capacity. The small diameter bars shown on the rear end of the rollway next to the furnaces are used for separating the heats in the furnace, and are termed separating bars.

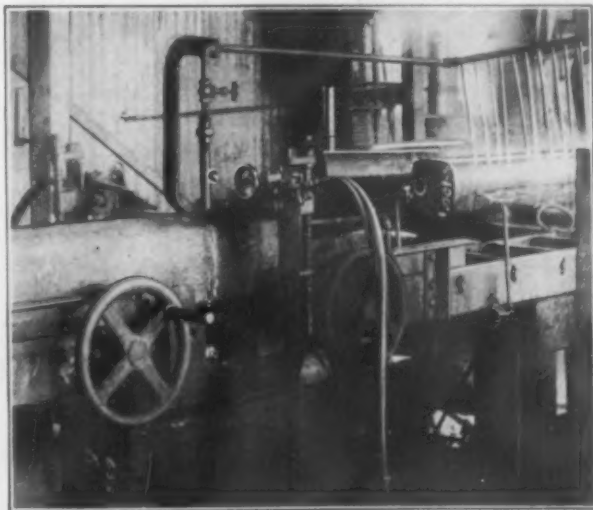
The scheme of handling material in plant No. 1 differs materially from that of plant No. 2, as shown in one of the illustrations. The blanks are carried in on trucks and piled on hearths by a magnet or tongs and hoist on light overhead bridge cranes. This arrangement, though satisfactory, does not compare with the arrangement for feeding the furnaces at plant No. 2 as to capacity or cost of operation. The discharging ends and hearths of the furnaces in plant No. 1, however, are similar to those of plant No. 2.

The company believes that it has obtained satisfactory service from its furnaces and greater output with the least inconvenience to the men. It has never had a single cracked forging due to too quick heating of the blank, and has never had a burnt blank; and also the total forgings rejected because of eccentricity is but a very small fraction of 1 per cent. By having a short but wide furnace it is believed that all the benefits of a long and narrow furnace are obtained without any of its defects.

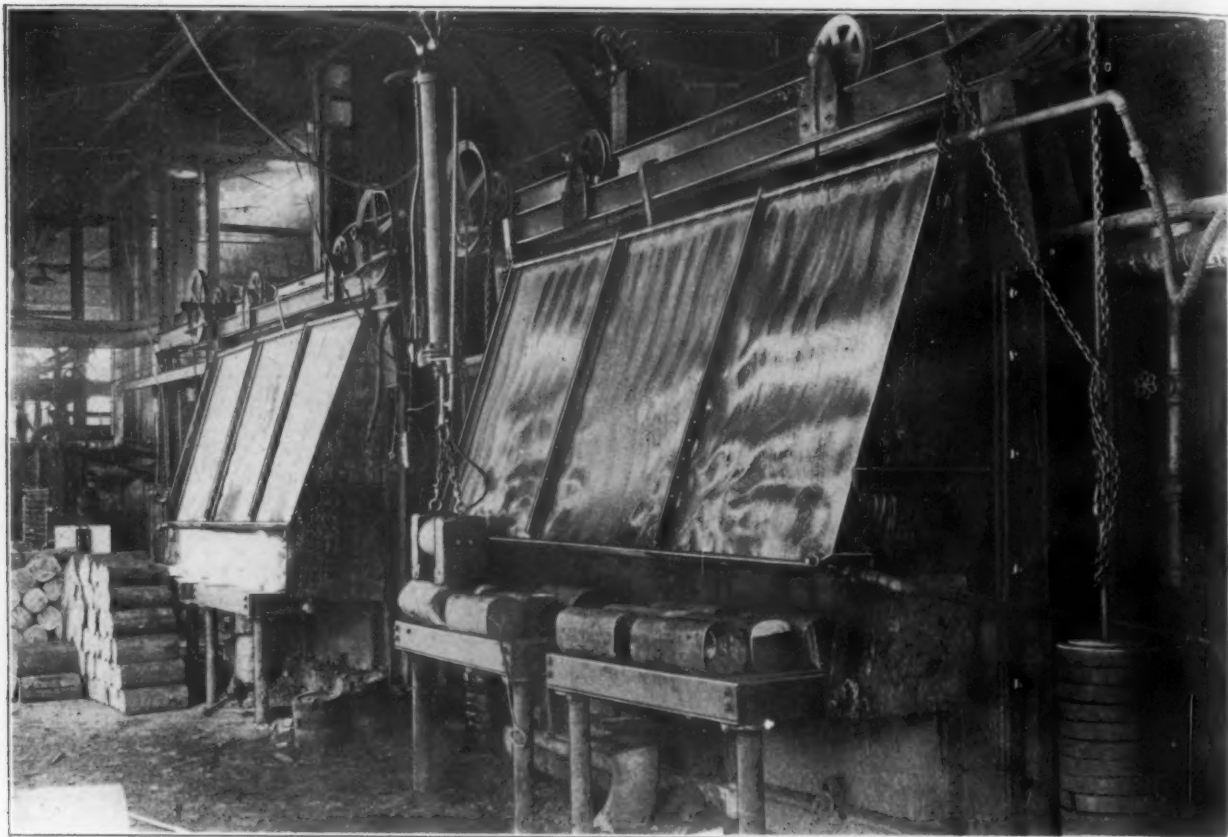
The cutting of long blooms of forged or rolled steel into short blanks, which was at first a troublesome problem, has now been reduced to a very simple process. The first method used was by pow-

erful hacksaws designed and built for this purpose. Mechanically, these saws were very satisfactory. A single saw would cut through a Gothic bloom $7\frac{1}{2}$ in. across the flats in 20 min., and made on the average, including handling, 40 cuts in 20 hr. A battery of 32 saws was required to cut 1200 blanks a day. As the hacksaw made a cut only $\frac{3}{32}$ in. wide, compared to a $\frac{3}{8}$ -in. kerf of a modern rotary saw, the saving in steel by the use of hacksaws was considerable.

The saws, now no longer used, were designed and built by the company, were 16 in. long from center to center of hole, $1\frac{1}{2}$ in. wide, and 0.065 in. thick, having six teeth per inch. The total stroke of the saw blade was 6 in. Two saws were placed side by side on a common base, making two cuts simultaneously. The bloom was held in place by three heavy screw clamps. Each battery of four saws was served by a rollway and a steel-topped table leading to each pair of saws. Two batteries of saws were driven by a 20-hp. motor. The cuts



Oxy-Acetylene Torches for Nicking Blooms, Later to Be Broken into Blanks by a Press, Have Proved More Expeditious than Hack-saws



Blanks Are Brought in on Trucks and Piled on Hearths by Overhead Cranes in Plant No. 1, But This Does Not Compare with the Arrangement of Plant No. 2 as to Capacity or Cost of Operation

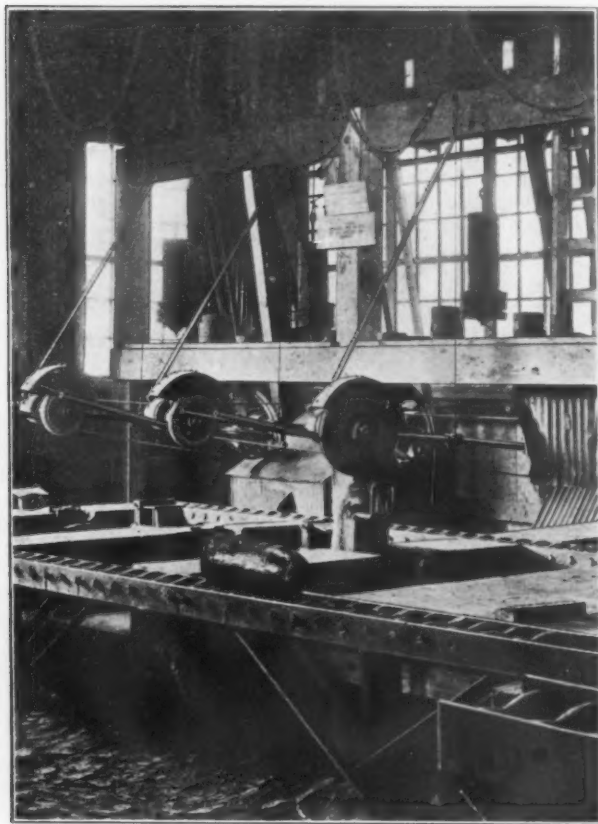
made by the hacksaws were clean and mirror-like, showing up the slightest imperfection in the steel, and were, therefore, very satisfactory from the viewpoint of inspection.

When the doubling of the forging capacity was undertaken, the company resorted to the use of the oxy-acetylene torch for nicking the blooms and a

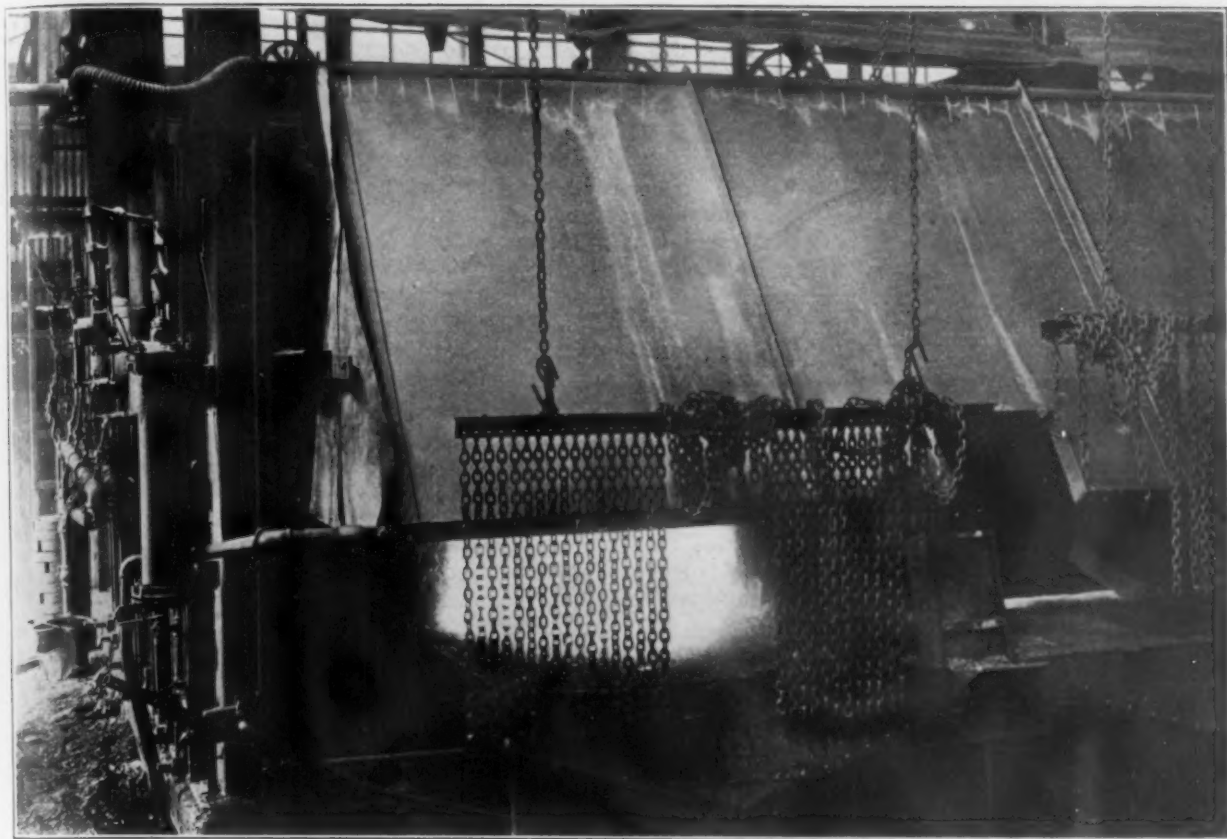
press for breaking them. After using several designs of torching machines it finally adopted the machine shown in our illustration, which proved very satisfactory. The blooms are inspected and marked for length of blank to be cut, then passed along a rollway to the torching table. Two rolls of the rollway are equipped with hand wheels, so that the bloom can be accurately moved along these until the mark on the bloom comes directly under the torch. The torch is moved up and down by a screw, and in and out by a rack and pinion. The bar is nicked about $\frac{7}{8}$ in. deep on one side only, and as soon as the nick is made the bloom is moved one length and the nick cooled by cold water, after which it is rolled to the breaking press, nick down, and accurately placed so that the breaking blade is directly over the nick. The power is then turned on and the bloom broken clearly and squarely. The press has 300 net tons capacity, which is sufficient to break $8\frac{1}{4}$ -in. Gothic bars. The lower breaker anvils on the press are adjustable in and out with a maximum distance between anvils of about 20 in. and a minimum distance about 6 in.

An unusual shed is used for unloading individual cast ingots from the cars in plant No. 1. It is a box-shaped structure, open at both ends, and bridging tracks so that cars can easily be run in and out. Under this shed 2000 ingots can be unloaded in 20 hr. Two light tongs, similar to ice tongs, each operated by an air hoist, are used, each tong catching one ingot at a time. A man standing near the end of the freight car, on a board running from the side of the car to a ladder at the side of the shed, has a full view of the interior of the car as well as the receiving platform, and operates the air-hoist valve. This arrangement is well protected from the weather, and has proved to be safe, rapid and dependable. The tongs have been found both quicker and safer for handling ingots than magnets when unloading cars.

Adjacent to this unloading shed is the inspection



The "Ingot Hospital." The tilting cradle under the foremost grinder is upright to facilitate grinding the nose



Powerful Air Blasts Directed Upwards and Rearwards, Chains and Water Shields Protect the Workmen from Excessive Heat During the Hot Summer Days of St. Louis

room, an interior view of which is shown. As the ingots are lowered by the tongs from the freight car they land on an iron shelf just outside of the open windows. They are then passed along the rollways to one of the inspection benches, where they are examined to see that each ingot bears the foundry examiner's acceptance stamp, that the steel fracture shows no piping, blow holes, segregation or sponginess, that the surface is free from cracks, splits or other defects, that the surface is free from cast iron from the ingot molds adhering to the surface of the ingot, and that the weight of the ingot is within specified limits. If the ingot passes inspection it is placed on one of the trucks. If defective, it is put in a scrap heap at one side. If it is light in weight, it is put into a reclaimer pile, later to be forged into a special small-diameter die making a thin-walled forging. If the ingot requires grinding, chipping or torching before it can be forged, it is put on a truck and sent to the "hospital," described later. The inspection room has three tables, and a capacity of 100 ingots an hour.

The receiving, inspection and storing of all steel used at plant No. 2, and, in addition, the shipping of all the forgings from this plant, is done in a single shed. This shed has a long central platform, shown in one of the illustrations, with railroad tracks on either side, and on this platform the ingots are unloaded and inspected. At the left of the platform is a long rollway for transporting the ingots lengthwise. Ingots that fully pass inspection are moved along the rollway to a point opposite to which they are to be piled, and then piled by means of a small magnet on an air hoist carried by a movable wall jib crane. These jib cranes are readily movable without a load from one piling position to another.

Ingots that require hospital treatment travel to the far end of the receiving platform, and are car-

ried by a wall jib crane located there to the opening in the wall leading to the hospital. Any rejected ingots are held on the receiving table temporarily and then loaded by a wall jib crane or by the overhead crane on a truck on the industrial track and taken to the scrap yard. The wall jib cranes also carry ingots from the receiving platform



Twin Magnets on Overhead Cranes Expedite the Loading of Finished Forgings into Cars for Shipment

rollway to receiving doors in the forge-shop wall, where they pass on to the rollways inside the building for storage back of the furnaces. Rollways are used by the principal longitudinal movement of the ingots, while the wall jib cranes take care of the piles, leaving the traveling bridge cranes free for other work.

The loading of cars with forgings for shipment is done principally from the shipping platform. A gravity rollway passes underground and carries the forgings from the storage floor of the furnace building to a pit under the shipping platform. From here a pneumatic hoist elevator lifts three forgings at a time to the shipping-platform level, after which they are rolled from the platform into the cars. The crane in this shed has a capacity of 3 tons, and is equipped with a pair of 24-in. magnets. These arrangements for receiving and shipping, it is claimed, have proved very satisfactory.

Ingots which inspection has shown to have removable blemishes are sent to the so-called ingot hospital, there to be remedied by grinding, chipping or burning, as the need may be. Grinding of an ingot is principally confined to the nose, where cast iron from the ingot mold is likely to adhere. This cast iron must be removed before forging, or it is said a non-machinable nose will result. It is also necessary to remove all lumps appearing on the nose of an ingot, though in some cases these lumps are steel, being formed in the depression made in the mold by the breaking away of the cast-iron part adhering as a lump to an ingot. The nose of the ingot is ground with the ingot standing free on a tilting cradle. This cradle, when horizontal, is virtually a portion of the flat table as shown under the middle emery wheel.

When surface blemishes can best be removed by grinding, the ingot is rolled on the cradle, but both the ingot and the cradle are kept in a horizontal position during the grinding operation. Some ingots may have cracks or blemishes that can be removed by pneumatic chipping hammers, and others have blemishes or fracture irregularities that are best removed by the oxy-acetylene torches. Such ingots are carried by the rollway to the tables where they are chipped or torched. When ingots leave the hospital they pass to the rollway next to the wall and move down this rollway until opposite the pile in which their heat is located, which may be either inside the building or under the receiving shed.

The view of the ingot hospital shows in detail the rollways used throughout the plant for moving blanks, ingots or shells. These rolls are $4\frac{1}{2}$ in. at their largest diameter, are 10 in. long, operate on a 1-in. shaft, and are placed 6 in. center to center. When it is desired to roll the blank sideways off of the rollways the side angles are 3 in. by 4 in., and when high sides are wanted on the rollway to prevent the ingots or blanks rolling off, the side angles are 3 in. x 5 in. For ordinary flat rollways the rolls have plain drilled bearings and turn directly on their shafts, but for inclined rollways they are bushed with a simple ball bearing, and turn with low friction, so that the ingot or forging moves by gravity. A slope of 1 in. in 12 in. is required for these rollways.

For the purpose of obtaining test specimens from their 8-in. shells the company makes use of a hollow drill, the design of which was suggested to them by the British Inspection Department. The test core, remaining in contact with the shell after the drill is removed, is easily broken off by a few blows from a sledge on a handled cold chisel, and it

is claimed that one man can cut 45 test blanks in a 9-hr. day. In order to obtain test specimens from the 9.2-in. forgings a 1-in. ring is cut from a long forging by means of a cutting-off lathe. These rings are cut into bars 1 in. square, by means of a milling machine. This method was used as there were not sufficient numbers of scrap 9.2-in. forgings to provide vertical test specimens, and a horizontal specimen enables the use of a forging which is longer than the required finished length, and is not damaged by cutting.

A series of 12 tests were made on 8-in. and 9.2-in. forgings made from cast ingots of various analyses by cutting two vertical and two horizontal specimens from each forging. The vertical specimens were taken, one near the outside and one near the inside of the forgings, separated 90 deg. The horizontal specimens were cut at 90 deg. to each other. These 48 specimens were pulled one after the other by the same man on the same machine, so that conditions were as nearly uniform as possible, and in every one of the 12 forgings the results obtained from the four specimens were practically identical, and the company's conclusion is that for forgings made from cast ingots test specimens taken horizontally or vertically, inside or outside, all give identical results. The vertical test specimen is preferable from a production viewpoint, as the horizontal specimen requires more expensive machinery and longer time.

Previous to undertaking munition work the Curtis & Co. Mfg. Co. manufactured sawmill machinery and saws, pneumatic machinery, and iron, brass and steel castings, the major part of the steel castings being heat-treated manganese steel for use in railroad frogs, switches and crossings. The technical men and executives were experienced in the design and manufacture of a wide variety of machinery, in the metallurgy of iron and steel, the tempering of saws and heat treating of manganese-steel castings, but were not experienced in making shell forgings. The first contract was taken October, 1915, for 150,000 8-in. shells, on which work was begun in February, 1916. At the present time the company has 1400 employees, occupies 12 acres of ground, and has a normal capacity of 4000 8-in. shell forgings per 20 hr., or 3200 9.2-in. shell forgings.

Many Reservations

Reservations made to date by exhibitors who expect to have exhibits in the Mechanics' Building, Boston, in connection with the convention of the American Foundrymen's Association, Sept. 28 to 29, total between 500 and 1000 sq. ft. more than last year's exhibit at Cleveland. An average of 320 sq. ft. each has been reserved by 120 exhibitors and that number of exhibitors ten weeks prior to the opening day is also a record.

It is announced that a part of the new rolling capacity of the Mark Mfg. Co. at Indiana Harbor, Ind., will go into operation this quarter, the open-hearth department in the fourth quarter of this year, and the 600-ton blast furnace, now building, in the first half of 1918. Its new Bessemer plant is in operation. Reference was made to these improvements in THE IRON AGE of June 28.

The Vilter Mfg. Co., Milwaukee, maker of ice and refrigerating machinery, Corliss engines, etc., has been awarded several large contracts by the Government for the equipment of refrigerating plants at military encampments of the United States and at the French front. The contracts aggregate about \$375,000 in value.

Coke-Oven Gas and the British Fuel Problem

Discussing the economical use of coal in Great Britain as a war measure before the Incorporated Municipal Electric Association, J. A. Robertson said in substance regarding coke-oven gas:

The distillation of coal at low temperatures for the primary purpose of producing metallurgical coke and yielding a quantity of surplus gas of high calorific value in addition to other by-products has been advocated as a universal solution of the fuel economy problem. The low temperature at which the coal is distilled permits of the recovery of by-products which are lost in the producer system. A little consideration, however, shows that as a means of producing power, the coke oven can have only a limited application. The demand for electricity in the form of light, power and heat is bound to exceed enormously the demand for coke and by-products and while the surplus heat from coke-oven gas should be fully utilized, either in independent power stations or where convenient in conjunction with larger power systems, the process cannot be looked on as more than a partial solution of the fuel economy problem.

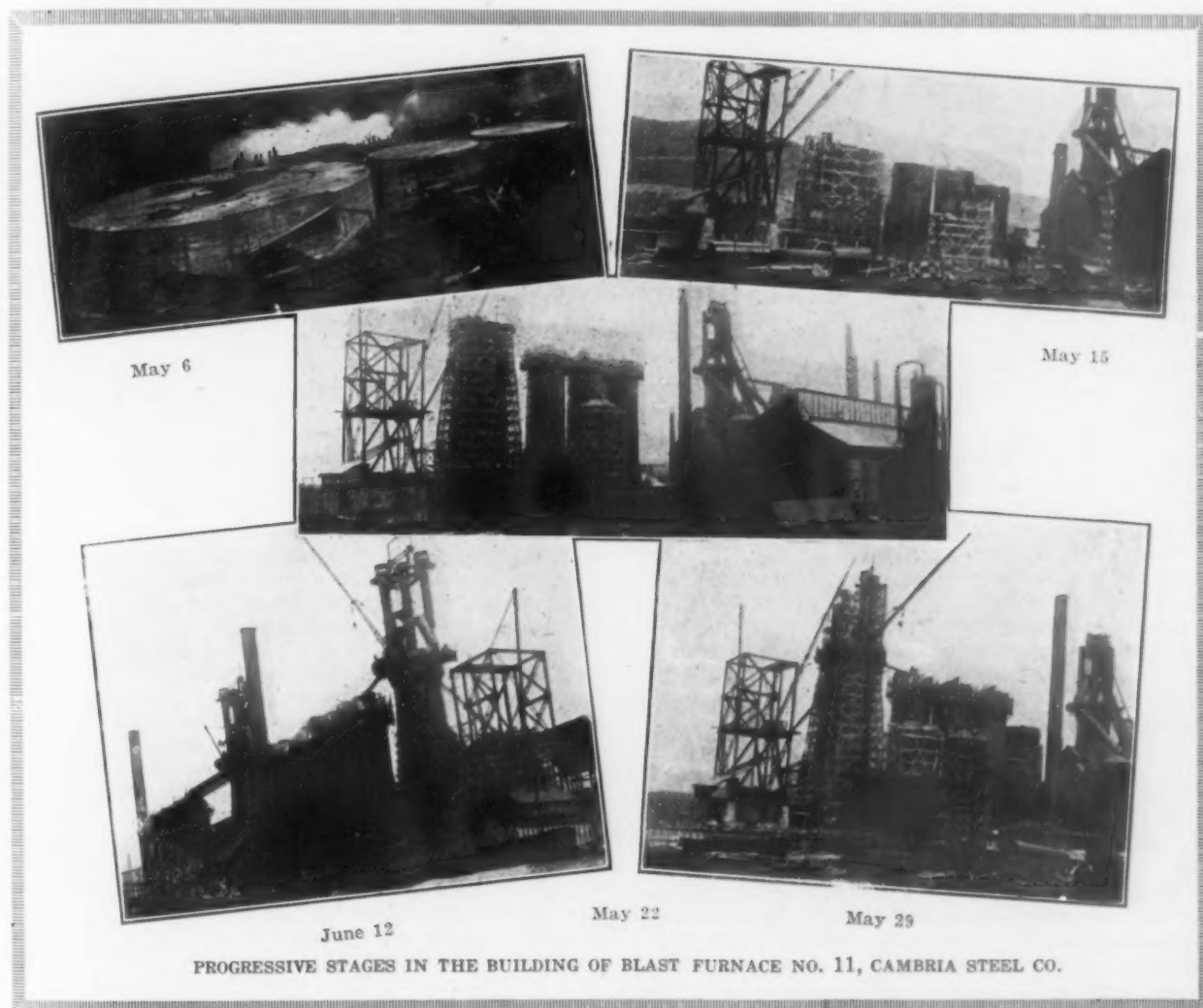
CAMBRIA'S NEW RECORD

Completion of No. 11 Blast Furnace with Its Stoves in Fifty-seven Days

Since the record breaking construction of Cambria Steel Co.'s No. 9 blast furnace, which was started March 12, 1916, and completed in 85 days, two additional furnaces, Nos. 10 and 11, with entirely new equipment, have been rushed to completion.

The erection of No. 11 blast furnace, with its four 20 x 100 ft. stoves and stack, was started May 7 on the foundations, as shown on photograph dated May 6, 1917, and on July 3 the furnace was put in blast, establishing the marvelous record of constructing a 500-ton blast furnace in 57 days, as stated in THE IRON AGE of July 12.

These furnaces are of the same general design as No. 9 blast furnace, a description of which was published in THE IRON AGE, June 15, 1916.



PROGRESSIVE STAGES IN THE BUILDING OF BLAST FURNACE NO. 11, CAMBRIA STEEL CO.

It is claimed that instead of metallurgical coke, a soft smokeless fuel can be produced, which is suitable for domestic purposes, and proposals have been put forward to combine an installation for producing such a fuel with a central power station, the surplus gas being employed to fire the boilers. An arrangement of this kind can have only a local and temporary application and the burning of fuel for domestic purposes must ultimately be superseded by electricity. To set up a process with the object of producing fuel for cooking and heating is to perpetuate a custom which all are agreed should be superseded, not only for reasons of fuel economy, but also with the object of saving labor now employed in unnecessary domestic drudgery.

The Shepard Electric Crane & Hoist Co. has found it necessary to procure larger offices in New York, and will move from its present location at 50 Church Street to 30 Church Street on Aug. 1. The Philadelphia office of the company will move for the same reason from the Stephen Girard Building to the Bulletin Building.

The equipment of Nos. 10 and 11 stacks differ from that of No. 9, inasmuch as they are provided with gas washing equipment for supplying clean gas to the stoves, and in addition to this, these furnaces are blown by three 40,000 cu. ft. General Electric turbo-blowers, one of which is a spare. The stock is supplied to the stacks by the Otis Electric skip hoists.

Steam for the furnace plant is generated by 10 768-horse power B. & W. boilers, which are fired by blast furnace gas. Nos. 10 and 11 blast furnaces are located at the Franklin plant in direct line with Nos. 7, 8 and 9. The construction of Nos. 10 and 11 was under the supervision of John C. Ogden, general superintendent. No. 11 furnace was lighted by Edwin E. Slick, Jr.

The Southern Foundry Co., Owensboro, Ky., has begun installation of a new cupola of 20 tons capacity, replacing the present 10-ton cupola.

War Tasks of the German Steel Industry

Raw Materials and Substitutes—Plans for Technical Research — Post-War Economic Contest—Manganese in Slags

AN important meeting of the Association of German Ironmasters (Verein Deutscher Eisenhüttenleute) was held in Düsseldorf, Germany, on March 4, 1917, and detailed reports of it are just reaching this country. The most important discussion centered about the notable efforts the German iron and steel industry has put forth during the war and the steps that are being taken to prepare for the future struggle for the world's markets. Sir Robert Hadfield has translated a report of the meeting which has been printed in pamphlet form and throughout which the organization is referred to as the German Iron and Steel Institute. In an introduction to the translation he says:

"It can hardly be imagined that the speakers at the meeting could have thought that within a short time afterwards their views would be read in this country, so probably they were freely expressing their opinions.

"The translation represents statements well worth careful reading, not only because of their direct but also of indirect bearing.

"In the proceedings there is apparent a fear that Germany after the war is going to lose or have her trade seriously crippled, also that she must so organize her empire as to be independent of outside supplies. It also appears to be admitted that our enemy has become aware of the fact that in the future she will not be allowed to prey upon other countries' trade and that she recognizes what a serious difference will exist after the war, quite apart from the question of tariff or no tariff in other countries. This is probably the reason why Germany is fighting so desperately, and why she is so uneasy, and prepared to go to any lengths in this great struggle.

"The article indicates shortage of essential materials, as is evidenced by the urgent necessity of providing substitutes in many branches of technical requirements. It is interesting to note, one might say with some surprise, seeing how Germany has been held up as a pattern of organization, that she is suffering from the same ailment as ourselves—that is, the multiplication of commissions and committees."

The Institute's War Tasks

The principal paper of the meeting was a report by Dr. Otto Petersen on "The War Tasks of the German Iron and Steel Institute." A translated abstract follows:

The speaker in the first place pointed out that he had to confine himself to dealing with the war tasks of the institute *per se*, as these tasks, in their wider connection with the activity of the iron industry during the war, could not be reported upon until after the records of the war had been completed.

Supply of Raw Materials

Among the war tasks of the institute the question of the supply of raw materials was a very wide one. More especially the supply of coal lately played an important part, above all other questions, concerning the supply of raw materials for the iron industry. Luckily it was only during the very last few months that hitches occurred which were not due to the natural conditions of the mining industry or to lack of labor, but solely attributable to difficulties of transport and to the exceedingly severe winter which completely paralyzed coal traffic on the waterways. Moreover, the extraction of lignite, which for about 10 years past has been used in increasing measure in the western industrial establishments, was greatly impeded by the frost.

Iron and Manganese Ores.—A more gratifying aspect than that of the coal supply is presented by the supply of iron ore during the past year, in so far as it may be considered assured under present conditions.

On the other hand, the supply of manganese ore again called for further efforts, which, notwithstanding good progress realized partly by increasing the home production and partly by endeavors to utilize all manganese substances to the utmost extent, cannot yet be considered to have fully achieved their end. The supply of ferrosilicon promises, subject to certain reservations, to become very satisfactory in future.

Electrodes and Aluminum.—The efforts towards increasing the capabilities of output of the electrode works by standardization of carbon electrodes, have led to a satisfactory result through the co-operation of all concerned. As regards the supply to steel works of aluminum for the deoxidation of steel, the institute has continued to act as an intermediary.

Magnesite and Refractories.—The institute has also co-operated towards regulating the importation of magnesite from Austria and will continue to exert itself in this question. Similarly, the institute has endeavored to assist, conjointly with the representative bodies of these branches of industry, in the solution of problems confronting the German manufacturers of refractory bricks, etc., and the limestone and dolomite quarries in matters concerning labor, transport and raw material, more especially by recommending the utilization of available refractory materials lying in the occupied territories.

Lubricants.—A troublesome question was the supplying of our works with suitable lubricants, more especially seeing that certain sources of supply of oil, which seemed to be available, cannot yet be used at present. However, by the manufacture of briquettes of mineral wax, the rolling-mills at least have obtained a lubricant serviceable for war-time purposes, and further experiments at obtaining, in our gas-producers, so-called "low temperature tar" have led to a successful result which imperatively calls for the widest possible application of this process in practice. The importance of supplying the iron industry with lubricants in sufficient quantities has induced the association to establish, in conjunction with the Mining Association of Essen and the northwestern group of the Association of German Iron and Steel Manufacturers, a department specially entrusted with the solution of the multifarious questions in the domain referred to. This so-called Office for Advice Concerning Lubricants and for the Control and Licensing of Supplies Thereof for the Rhenish-Westphalian Mining and Metallurgic Industry will, above all things, give advice to the works by specialists sent to the spot. The question, which was becoming serious for a time, as to how oil for large gas-engines could be procured for the works may be considered to have lately been solved satisfactorily by suitable measures taken by the War Lubricating Oil Company.

Vitriol of Copper.—Although during the past year it was found possible to supply the wire-drawing mills satisfactorily with vitriol of copper—a task in which the institute took part under the distribution scheme—further attempts have been made at reducing the consumption of vitriol of copper, and also at the same time replacing vitriol of copper by other wire-drawing mediums, and they give good grounds for hope that perhaps a tangible result may still be attained hereafter.

Calcium Carbide.—The measures taken for safeguarding the supply of calcium carbide led to the institute being entrusted with the distribution of this material to the western iron industry, and this function is being taken up by the institute, commencing from April 1.

Supply of Special Alloys.—In the work which our institute had to perform for the Association of German High-Grade Steel Works, it was afforded an opportunity of co-operating in the meritorious discharge of the tasks of the war raw materials supply department

and of the Aktiengesellschaft Kriegsmetall (War Metal Co., Ltd.) for the purpose of supplying the works with metals for alloying. Hitherto it has been possible, partly thanks to the fortunate co-operation of our commercial U-boats, to meet the requirements of alloy metals, such as chromium, tungsten, molybdenum, etc. However, it became necessary to create quite a special organization in order to regulate the consumption of high-speed tool steel, which organization is as yet too new to admit of forming a definite judgment. At any rate the efforts of the industry at effecting economies in the consumption of high-speed tool steel have been very successful.

Provision of Steel

An exceedingly large place among the war problems of the institute was taken by the provision of steel for the various branches of the war office and the shell factories. The statements made by the speaker on this subject showed what enormous efforts had to be made on the part of the iron industry in order to cope with the increasing demands of the army, that various organizations had to be created in order to carry out the large program drawn up, and that, in the course thereof, numerous functions fell to the share of the institute as an intermediary agency between the public authorities and the works concerned. In this connection, attempts have recently been made to relieve the additional strain to which our engineering works would otherwise have been subjected by the extra work required for the enlargements of plants—by resorting to the utilization of iron-works plants existing in the occupied territories—with regard to which measure the institute has again offered its co-operation.

Suggestions made by the institute with a view to improving the arrangements for the husbanding of the so-called economy metals have led to the result that a decentralization has been adopted as regards the preliminary examination of applications for licenses for the supply of such metals, which has fully met the expectations, more especially as the departments carrying out the tests of experiments as regards these economy metals at the works have co-operated in a wholehearted and intelligent manner.

Replacing of Copper Tuyeres.—The question of replacing copper blast-furnace tuyeres by iron ones has been busily occupying the institute, and has led to the standardization of their dimensions with a view to the more advantageous production of blast-furnace tuyeres and to the extension thereof to the tuyere box (blast box) as well.

Other Substitutes.—Besides serving as adviser to the industry in general the institute in many cases advised individual works who consulted it on various special questions, more particularly as regards bearing metals and substitutes for rubber and leather. Also the diversity of interpretations of the regulations concerning the traffic in economy metals led repeatedly to the intervention of the institute between the public authorities and the works. Similarly the institute was frequently requested by the authorities to investigate preliminarily and give an opinion on applications for licenses for supplies of copper articles required by the works—a task which was not always easy of solution if justice was to be done from all points of view.

The large dimensions gradually assumed by the work in the department for the control and licensing of supply of belting, induced the institute, in conjunction with the Mining Association of Essen, to contemplate the establishment of a special branch office of this control department (similarly as done with regard to lubricants) for the district of the Rhenish-Westphalian mining and metallurgical industry, in order to be able to meet more promptly the requirements of this industry.

Lastly, the executive of the institute has volunteered its service in connection with the new arrangement for control of the consumption of iron and steel.

The Institute's Activities

The president of the institute, Dr. Fr. Springonum, in presenting his business report, had the following to say regarding the activities of the organization:

Use of Blast-Furnace Slag

The labors, mentioned last year, of the Blast-Furnace Commission, concerning the uses of blast-furnace slag, have been continued. As may be known to you, the Minister of Public Works has, on our petition, appointed a commission which is to inquire into the applicability of lumpy blast-furnace slag as a material for addition in the preparation of concrete, and as a bedding material.

At the last meeting of this commission, last February, the Royal Institute for Tests of Materials in Lichterfelde, which was entrusted with the carrying out of the experiments, submitted a report which will shortly appear in print. This report says, as regards the final results:

With blast-furnace slag, provided that it possesses the properties of that experimented with in this instance, a good concrete (rammed and ferro-concrete), and under circumstances even a better one, can be prepared than with gravel material. Even suspect concrete, that is to say, concrete prepared with slag having a tendency to disintegration, has proved serviceable. Iron embedded in concrete prepared with blast-furnace slag behaves in the same way as in concrete prepared with gravel. The slag exerts no direct influence as regards the rusting of iron embedded in concrete.

I may also point out, in this connection, that there exists in our institute a department for the investigation of bad results obtained in the use of blast-furnace slag, to which any such cases should be reported. Investigations made by this department have already been able to pronounce in several cases of complaint of alleged unfavorable results produced by slag in concrete, that the slag was unexceptionable.

In order to test the suitability of slag as a bedding material for permanent way formation-levels, experimental track sections will probably be laid down this year in order to ascertain in an unexceptionable manner to what extent the State Railway Administration may reckon with slag as a bedding material.

The Blast-Furnace Commission has, moreover, occupied itself with the question of replacing copper by iron as material for blast-furnace tuyeres and with the standardization of blast furnace tuyeres. This also applies to the experiments for rendering Siegerland manganese slag-sand lumpy.

Steel-Works Tar

The question already discussed at length of steel-works tar was once more taken up on the initiative of the technical committee of the Sales Association for Tar Products, in Essen on Ruhr. As the former labors had shown that it was impossible to lay down generally applicable data as regards a suitable composition of steel-works tar, on account of the varying local conditions, it is now intended to develop, in joint consultation, fixed methods of analysis for the examination of steel-works tar, in order that the results of tests obtained in different places may be comparable with each other.

The activity of the Chemists' Commission has, as hitherto during the war, been continued on the former lines. The first part—dealing with gravimetric methods of analysis—of the critical revision of the processes for the determination of phosphorus in iron and iron ores, has been completed; the experiments for the second part, dealing with volumetric methods of analysis, are progressing satisfactorily.

Mild Steel for Copper Fire Boxes

The technical commission of the Association of Thick Iron-Plate Rolling-Mills, whose business we are transacting, has repeatedly met in the past year. Their deliberations continued to deal chiefly with the substitution of mild steel for copper as a material for fire-box plates for locomotives. The results hitherto obtained with iron fire boxes may be called satisfactory, although a longer period of trial will be required before a definitive judgment can be found.

As regards promoting the home production of anchors and chains, we have repeatedly negotiated both with German manufacturers and with the consumers, more especially the Association of German Shipyards.

in order to secure for our home industry the supply of our requirements of anchors and chains after the war. I think I can hold out hopes of a satisfactory solution of this question, in which respect we are further relying on intelligent co-operation of the consumers, more especially of the shipowning concerns and also of the inspection societies.

Union of Technical Societies

The war has intensified the need, already felt before, of closer co-operation of the German technical societies, and preliminary negotiations on this question have led to a combination of the technical societies into a German Union of Technical-Scientific Associations. We have gladly joined this union and promised our co-operation, feeling sure that the purposes and aims of the union are the right ones. The union leaves to its individual members complete liberty in the special domain which each association has hitherto been dealing with, but wishes to insure joint action of the associations (whose number has now risen to eleven) on all important questions.

Organization for the Future

The titanic struggle of nations has confronted our iron industry in every direction with particularly great difficulties, and I hope that some day, when the war-time records of our works and our associations may be more freely disclosed, not only the full tribute of recognition will be paid for the great things which have been achieved, but that it will also be possible, immediately, to find ways and means of further pursuing, in the interest of the Fatherland, the thousand-fold problems which, arising from the emergencies of war, could, perhaps, be solved only in part during the war.

We shall, after the war, far more than hitherto, have to rely on our own strength. Accordingly, the demands on us will be enormous. Industry will only be able to meet them by strenuous work, and will, above all, have to study better utilization of fuels and the further perfecting of the metallurgical processes. Co-ordination between metallurgical practice and metallurgical research, which has always been insisted on and promoted by us, will in future be imperatively needed.

The necessity of promoting with all energy, by scientific research, the progress of metallurgy, with an eye to the exceedingly keen competition in the world's market to be anticipated after the war is recognized. The only divergency of opinions still existing is as to how such promotion can be effected in the best and most effectual manner, whether by the establishment of a special research institute, possibly attached to the Kaiser Wilhelm Society, or by the expansion of an already existing similar institution, or by studying the problems of research, as they arise, in one or the other scientific laboratory, but always while maintaining the requisite relations with the practical working establishment.

Discussion of the Report

Captain A. Thiele, manager, of Esch, said in regard to the creation of an Institute for Metallurgical Research: Quite a number of research institutions, both at our German academies and at the great iron works, are continually engaged, and with good results, in laboring to perfect our processes for the production of iron and steel. Nevertheless a want in this respect—the lack of a very wide-ranged, all-embracing research institution—has never made itself felt more strongly than just now, during the war, when a large number of new problems has confronted us which, sprung from an emergency, had to be tackled there and then, and which, in fact, have partly been brought to a certain provisional solution, but for want of the necessary collectedness and calmness are still awaiting a definitive solution.

Very rightly, attention has been drawn just now to the gravity of the fight which our German iron industry will have to carry on on all fronts after the war. And I think no one can doubt any longer to-day, that after the victory of our arms our enemies will en-

deavor with all their strength to inflict on us subsequently an economic defeat of the severest possible nature. Hence let us mount guard, in order that these machinations of the enemy may be countered from the outset with the requisite energy.

Problems to Be Approached

A plethora of problems will confront the Institute for Metallurgical Research about to be founded. Among them are the desulphurization of blast-furnace coke and the saving entailed thereby of manganese in blast-furnace working, the elimination from the ores of their water of crystallization and of chemically combined water, as well as the mechanico-chemical dressing of our ores in general, the development of the mixer to make it serve as a preliminary refining apparatus, the desulphurization of and elimination of manganese from Thomas slag, and the better utilization of the waste products of metallurgical working in general, the improvement of the deoxidation process as hitherto known, thermic control in steel-works and roll-mill working, and other matters.

Loss of Manganese and Iron in Slag

Permit me to discuss briefly, in particular, one of these many problems. Just picture to yourselves that, with the present utilization of our Thomas slag, we are causing each year 300,000 tons of iron and 150,000 tons of manganese, in the form of their oxides to be scattered on the fields and meadows of foreign countries, which is not particularly gratifying to these, nor can it afford any gratification to our economic life, seeing that it represents an annual loss of 20 to 30 million marks. If we can succeed in abstracting the manganese and iron from the Thomas slag we shall not only save a great part of this loss, to the benefit of our national economy, but in consequence thereof we shall, moreover, reduce by many hundred thousands of tons the quantity of manganese and iron ores to be extracted from our mines by us per annum. I will only mention incidentally that in the end this will also afford some relief with regard to the whole labor question, which after the war will confront us in an accentuated form.

Every practical man will clearly understand how important the solution of these questions is for our whole economic life. And, thanks to the high esteem in which we hold science, we may confidently hope that we shall find the key to the solution of most of them.

In conclusion I would once more second the urgent wish of our president that, as soon as possible, funds should be rendered available for creating such an institute for metallurgical results, and this already during the war, as the raising of very considerable funds will, after all, be easier to the iron industry now during the war than later on after the war, under the incomparably more difficult economic conditions likely to exist then. Taking all in all, what is in question here is an intellectual mobilization of our particular industry.

Large Vanadium and Tungsten Exports

The United States is fast becoming a large source to foreign countries of two new important steel-making alloys. The exports of both ferrovanadium and ferrotungsten and tungsten metal have grown to surprisingly large proportions since the war started. The May exports of ferrovanadium were 311,360 lb., the largest with one exception ever recorded, when they were 358,639 lb. in March, this year. The May exports of ferrotungsten were 463,680 lb., or the largest ever reported, the next previously large total this year having been 169,583 lb. in April. The following table shows the extent of recent exports in pounds:

	May, 1917	11 Months Ended May 31, 1917
Ferrovanadium	311,360	2,412,072
Ferrotungsten and tungsten....	463,680	1,612,122

Previous to the war practically no tungsten was exported. Vanadium exports before the war were less than one-quarter the present outgo.

Solenoid Operated Field Switch

A line of double-pole field switches arranged for solenoid operation has been brought out by the General Electric Company, Schenectady, N. Y. The

Small Industrial Caterpillar Tractor

For hauling in and around factory buildings the Cleveland Tractor Co., Cleveland, has developed a small tractor of the caterpillar type. It is designed as a



Uneven Ground Is No Obstacle to the Caterpillar Tractor Which Can Be Employed in Manufacturing Plants as an Aid to or a Substitute for the Industrial Railroad

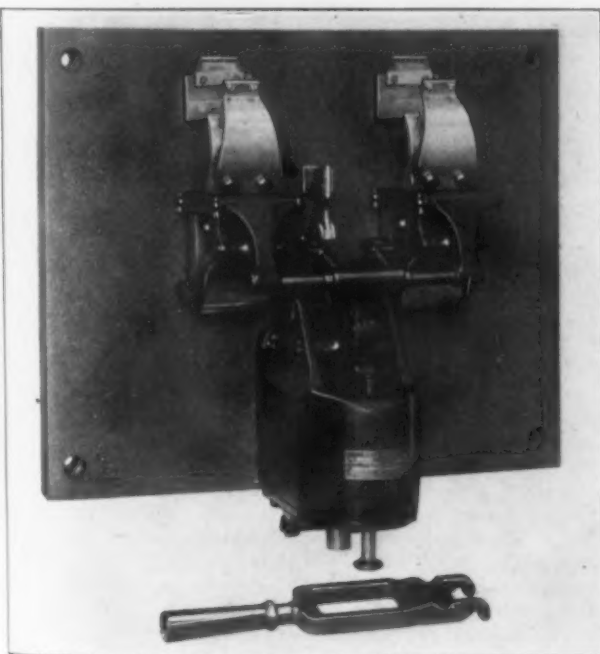
switches are similar in construction to a non-automatic solenoid operated air circuit breaker and are designed to be mounted on a base near or attached to the field rheostat, or on the exciter board which is located some distance from the main control board as a rule. They differ from the circuit breakers in having the carbon secondary contacts omitted and a field discharge switch added, the latter to introduce a resistance of sufficient value across the field to prevent injury to the field coil windings by the inductive kick which follows the opening of the circuit. If it is desired to trip the switch by hand an insulated button attached to

substitute for the narrow gage industrial railroads operated in connection with large plants. The fact that the tractor does not require roads or tracks for its operation enables it to pass obstacles and move material rapidly from one department to another.

The tractor is of the conventional caterpillar type that has come into extensive use for agricultural purposes in this country. As it does not travel on wheels but lays its own track the surface over which the tractor passes, it is emphasized, is not marred. This feature enables it to be used for hauling inside factory buildings, and as the over-all width is only 50 in. and the height is but 2 in. greater, the tractor can go through factory doors of the ordinary size. For use around industrial establishments where the ground is not even the tracks conform to the ground surface and do not require the laying of smooth pavements between the various buildings of the plant. The tractor can also be employed in the shipping room or loading platform for bringing material from the factory to cars that are to be loaded or in facilitating the unloading of incoming shipments.

Determining Moisture in Coke

In co-operation with the committee on coke of the American Society for Testing Materials experiments have been made by the U. S. Bureau of Mines to develop methods of determining moisture in shipments of coke. It was found that the moisture in coke could be determined by much simpler methods than those required for coal, because water in coke is all superficial moisture and in no way combined with the coke substance. As a result of these experiments the Bureau recommends that the moisture in coke be determined by drying the sample to constant weight at any temperature between 105 and 200 deg. C. The sample should not be crushed to pieces smaller than 1 in. No special oven is required. The foundryman may use a core oven to advantage or a warm place in the boiler room. The principal precaution to be observed is to dry the sample as quickly as possible after it is taken and to keep it in a tight container while it is conveyed to the place for drying. The experiments have further shown that wet coke can not be crushed without losing moisture. The results of this investigation will appear in a published report.



Double-Pole Solenoid Operated Field Switches for Remote Control Are Opened and Closed by Push Buttons on the Main Control Boards, the Switch Itself Being Mounted Some Distance Away on the Field Rheostat or the Exciter Board

the tripping coil plunger and easy of access can be used, while removable handles are provided for closing the switch by hand.

Government Will Build Many Steel Vessels

Unofficial Reports of Large Plants Near Philadelphia and Newark—Labor Problem Apt to Retard the Work—Numerous Other Projects

Plans of the Emergency Fleet Corporation for two Government shipyards to build 400 steel vessels within the next 18 months or two years are well under way, according to the best unofficial information obtainable by THE IRON AGE. Official confirmation is not to be had.

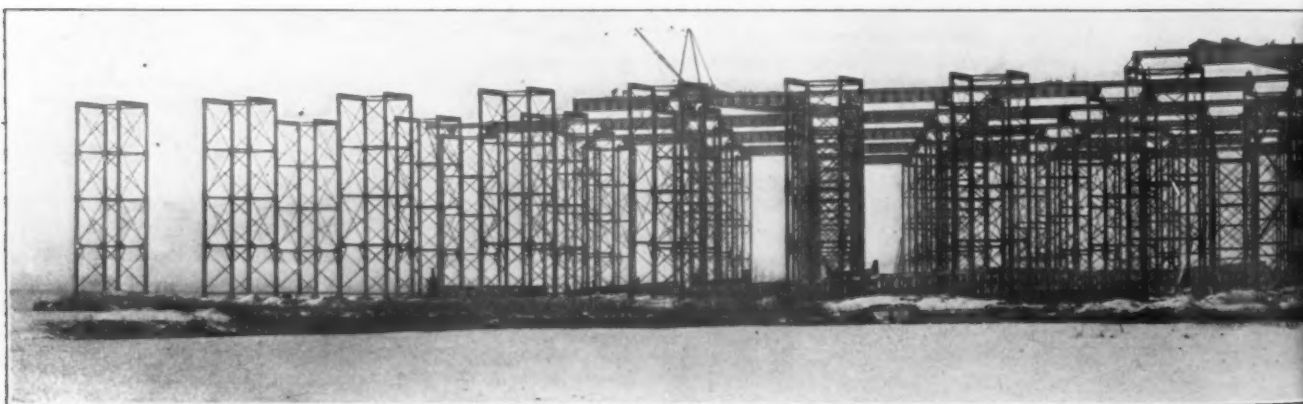
General Goethals recently announced that there would be two yards, one near Philadelphia and one near New York or Newark. It has become known within the past few days that the Government has acquired a large site on the Delaware River, near Fort Mifflin, said to comprise 900 acres, and that it will have the co-operation of the American International Corporation, Stone & Webster and the National City Bank of New York and the New York Shipbuilding Corporation. L. D. Lovekin, chief engineer of the New York Shipbuilding Corporation, has been "loaned" for the Government project and with a corps of assisting engineers has been busily engaged for weeks on plans for the plant. The size of the contract to be taken by the American International Corporation is, according to unconfirmed report, about \$250,000,000. It is proposed to employ 15,000 men at the Delaware River plant.

The other Government plant will be established on Newark Bay, where a large tract of land has been leased by the Submarine Boat Corporation, which, with the assistance of the Lackawanna Bridge Co., will undertake to build a large number of steel ships. That there is every intention of beginning work soon on this

this manner, it is understood that 200 will be of 5000 tons register and 200 of 7500 tons register. It is said that the Submarine Boat Corporation will build about 1,000,000 tons of 5000-ton boats and the American International Corporation 1,500,000 tons of 7500-ton vessels.

Closely rivalling the Government yards are the plants affiliated with the Bethlehem Steel Corporation, with the decided advantage in favor of the Bethlehem yards that they are now actually building ships, while many of the other projected shipyards, including the two Government plants, are still on paper. The Bethlehem yards, which include the Fore River Shipbuilding Co., Quincy, Mass., the Union Iron Works of San Francisco, the Maryland shipbuilding plant of the Bethlehem Steel Corporation at Sparrow's Point, Md., Harlan & Hollingsworth of Wilmington, Del., and Samuel L. Moore & Sons, Elizabethport, N. J., are now engaged on a great deal of work both for the United States Navy and on private merchant vessels, and their managers stand ready to undertake any further shipbuilding program that the Government suggests.

Many of the new companies which have been organized in the expectation of receiving Government contracts will not discuss their plans for fear of the effect such discussion might have at Washington. There should not be too much optimism regarding the ability of such concerns to turn out any very large tonnage during the next year because of the difficulties they will



The New Steel Shipbuilding Plant of the Sun Shipbuilding & Repair Co.

plant is indicated by the fact that the Lackawanna Bridge Co. last week sent out an inquiry for four five-ton cranes, specifying delivery within two months. During the past two months, the engineers of the Lackawanna Bridge Co., with the co-operation of General Goethals, have been entering into tentative contracts with fabricating steel plants for the furnishing of the fabricated plates and shapes for the steel merchant ships. It is said that more than 100 fabricating plants will be engaged in making standardized sections, which will be assembled at the Newark yard. It is presumed that a similar plan will be adopted by the American International Corporation, inasmuch as it has been announced that the Government yards will both be fabricating and assembling yards rather than shipyards in the general acceptance of the word.

Rapid Work Expected

It is admitted that it will take from six to eight months before a ship will be ready to launch at either Government yard, but after the first launching, the pace will become rapid, and about 100,000 tons a month will be the approximate output at each yard until the contract is completed. Of the 400 ships to be built in

have in obtaining equipment for their plants. Several companies are going ahead regardless of assurances of Government contracts and hope to be in a position to convince the Emergency Fleet Corporation of their ability to fulfill their promises.

Other Plants Planned

The Groton Iron Works, 50 Broad Street, New York, of which C. W. Morse is the head, is planning the construction of a steel shipbuilding plant at New London, Conn., to cost about \$2,000,000. This company already has a plant at Noank, Conn., where wooden ships are now being built. It is said that the Groton Iron Works has not as yet received a Government contract for steel ships, but is making a bid for one.

Whittlesey & Whittlesey, naval architects, who for some time past have had plans ready for a steel shipbuilding plant to be operated under the name of the Southern Shipbuilding Corporation, 17 Battery Place, New York, have presented to the Emergency Fleet Corporation a plan for steel vessels of a standardized type. Whittlesey & Whittlesey are said to have worked out a design that will make it possible to dispense with long ship rolls necessary for bending plates. There will be

from stem to stern but a single bent plate and such plates, it is said, can be turned out in any bridge plant and can be shipped flat on railroad cars. Whittlesey & Whittlesey purpose to construct cargo ships 375 ft. long with a 52-ft. beam, and with a capacity of 7500 tons. The plans and specifications are said to have been approved by Theodore E. Ferris, naval architect of the Emergency Fleet Corporation and by the American Bureau of Shipping. It is proposed to lay down 16 ships at a time for which a yard is to be established at a southeastern Atlantic port. The fabricating is to be done in the Birmingham district. Whittlesey & Whittlesey promise to have ready for delivery between 32 and 48 of these vessels within 18 months.

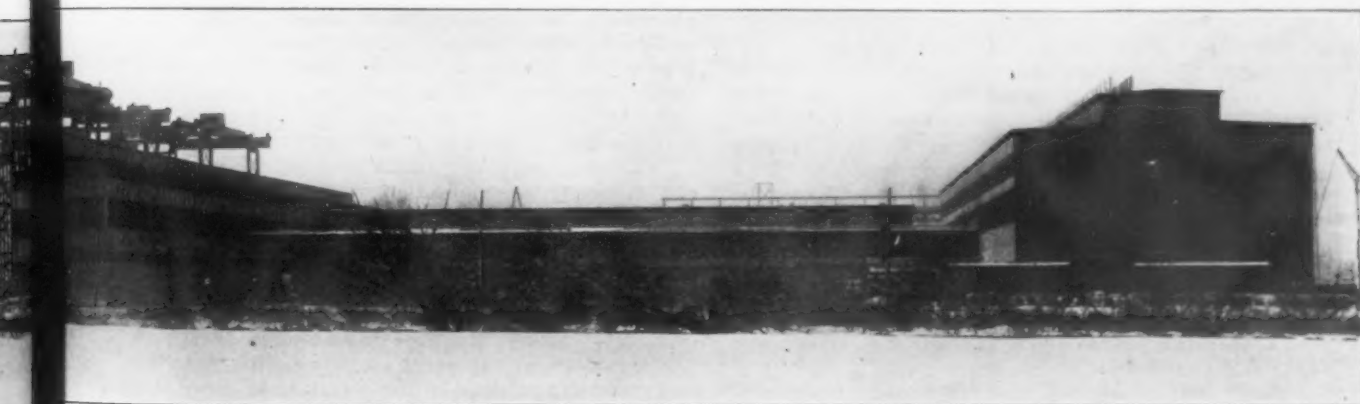
Formal transfer of the steel fabricating plant of Milliken Bros., Inc., on Staten Island to the Downey Shipbuilding Corporation, 120 Broadway, New York, took place last week. The announcement that the sale would be made was published in THE IRON AGE several weeks ago. Mr. Downey said that \$1,300,000, as a final payment on the contract entered into several months ago, had been turned over to Lorenzo C. Bilks, president of Milliken Bros., Inc. The Downey Shipbuilding Co. took possession at once and will convert the plant into a shipbuilding yard capable of manufacturing 100,000 tons of standardized steel steamships a year. The Downey Shipbuilding Corporation has a contract to build ten 7500-ton steel steamships for the Emergency Fleet Corporation.

A member of the editorial staff of THE IRON AGE visited several of the shipbuilding plants on the Delaware River last week. Most of these plants are extremely active with work which they have had on hand for some time past, the most serious drawback to 100 per cent efficiency being the shortage of skilled labor. For example, the New York Shipbuilding Corporation's plant at Camden, N. J., is employing 5000 men and could use about 2500 more if they could be obtained.

many of the ships now being constructed there will be commandeered by the Shipping Board.

The William Cramp & Sons' Ship & Engine Building Co., Philadelphia, is completing plant enlargements which have cost in the neighborhood of \$1,500,000. This company, like the New York Shipbuilding Corporation, is very actively at work on ships for the Navy, in addition to which it has many contracts and a number of boats building for private concerns. Every ounce of energy is being put forth to complete naval vessels as early as possible and whether the Cramp yard will build any vessels for the Emergency Fleet Corporation is, so far as THE IRON AGE has been able to learn, not yet determined.

One of the most complete of the new shipbuilding plants along the Delaware River is that of the Sun Shipbuilding Co. at Chester, Pa. This company is an affiliation of the Sun Oils Co. of Philadelphia. Early in 1916, the shipbuilding company bought the engine works of the Robert Wetherill Co. and organized a shipbuilding plant with this works as a nucleus. An adjoining site of 80 acres with 2500 ft. water front was purchased and five shipways, each 600 ft. long, a mold loft 600 x 80 ft., a plate shop of the same size, a boiler shop and other buildings were erected. The Sun Shipbuilding Corporation is building three types of steel vessels, all of 10,000-ton capacity. One is an oil tanker, another is a cargo boat of 10½ knots and the third a cargo boat of 13½ knots. Eighteen other merchant vessels are under contract and three mine sweepers will be built for the U. S. Navy. Four of the 18 merchant ships under contract are for the Emergency Fleet Corporation. The operations of this plant are handicapped somewhat by a lack of labor. Eighteen hundred men are now employed and 1000 more could be used. At the present rate of employment, it will require six months before the plant can reach a thoroughly efficient working basis.



Building Co. on the Delaware River, at Chester, Pa.

Appeals have been made to the Government at Washington by the Atlantic Coast Shipbuilders' Association, which represents most of the large yards, for Federal assistance in obtaining a greater number of workmen. It has been impossible to obtain these by ordinary means and a policy of conscription was suggested to the Government but did not meet with an enthusiastic reception. The attitude of the Government officials is said to be one of let well enough alone so far as the labor question is concerned during the war, but Government officials glibly talked of equipping two yards each with 15,000 workmen. Those who are now building ships are asking, "Where are they going to get the men?" Unless some sort of labor conscription plan is adopted, it is believed by shipbuilders that the success of the whole Government's shipbuilding plan is threatened.

Large Amount of Government Work

The New York Shipbuilding Corporation has \$50,000,000 worth of Government work on hand, mostly naval vessels. In addition it is at work on more than 20 merchant boats of various tonnages and sizes. As yet this plant has not been asked to build any vessels for the Emergency Fleet Corporation, but doubtless

Ship Building at Chester

The Chester Shipbuilding Co. of Chester, Pa., is also building a number of steel merchant vessels. This concern recently bought another shipbuilding site including a number of shops at Bristol, Pa., and was granted a permit by the Commissioner of Navigation at Philadelphia to build 12 new shipways at the Bristol plant and four new shipways at the Chester plant. It is understood that these are to be erected in anticipation of the concern receiving a Government contract to build steel merchant vessels. There have been rumors that Harriman capital has been invested in this enterprise and that its plant will ultimately be one of the largest in the United States. Officials of the company decline to discuss these rumors at present and are withholding any definite announcement of their plans pending the decision of the Emergency Fleet Corporation on Government ship contracts.

The Pennsylvania Shipbuilding Co., Land Title Building, Philadelphia, and its affiliated concerns, the New Jersey Shipbuilding Co. and Pusey & Jones, are understood also to be expecting a Government contract

(Continued on page 236)

Women Employees in British Steel Works

Responsible Work in Making Munitions and Machine Tools—Classification of Their Capabilities as a Result of the War

THE extent to which women are employed upon responsible work of all kinds in England in engineering and other industries in making munitions has been prominently illustrated by means of an exhibition of photographs and samples of women's work recently held at Bristol, England. The *London Iron and Coal Trades Review* gives an extended account of it in a recent issue, together with illustrations, two of which are here reproduced as clearly as possible in the absence of the original photographs. The exhibition is one of a series arranged for various industrial centers by the Labor Supply Department of the Ministry of Munitions.

In various quarrying and building work views are exhibited showing women excavating, mixing lime, stone breaking, sieving, and feeding slag crushers for mixing concrete, mixing mortar and acting as bricklayers' laborers. In the manufacture of explosives and chemicals they are seen loading raw materials into ships, picking cotton waste, charging nitric acid stills with nitrate and stoking them, etc.

Women in Foundry Work

In foundry work they are shown making cores, operating a variety of molding machines, stump-molding and carrying molds from the machine to the trolley. In other views they are fettling, riddling and transporting sand.

In constructional engineering women are seen both as helpers and as operators on heavy as well as light work; cutting steel bars on a circular saw and on a band saw, drilling angle and T-bars, operating a large punching and shearing machine on junction and tie plates, etc. In one view four women are in charge of 12 drilling machines, working on a steel boom for bridge girders; in another a woman is in charge of three radial drills on a lattice girder for a railway bridge; in another drilling a cast-iron bedplate. In a further view a woman is helping with a hydraulic riveter, steadying and placing the machine on hot rivets; in another a woman is marking out channels for the main boom of a girder for a railway bridge.

In shipbuilding and marine engineering photographs show women electric-wiring on board, counter-sinking plates, operating radial drills, grummeting, tubing and expanding condensers for marine engines.

A still greater variety of work is seen in general

engineering. Women are shown attending power plant up to a 1000-i.h.p. Belliss engine, taking charge of electric generating plant and large switchboards, operating electric overhead and jib cranes up to 60 tons, and driving electric trucks. In the machine shop various views show women boring a boiler shell, placing boiler plates on an edge planer, etc. In a locomotive shop they are seen working slotting, milling, shaping and other machines on motion details and other locomotive parts, and a variety of other machines. Specimens are shown of a finished engine axle-box, a bogey wheel center, and other locomotive parts, made by women.

The section of tool-room, gage and allied work deserves particular attention, because many of the specimens shown illustrate strikingly what is also to be found in other sections—the ability of women to undertake not only repetition work, but also individual jobs with short runs, for which the operator sets up both the work and the tools.

Making Machine Tools and Shells

In machine-tool making, women are seen lining the fast heads of lathes to micrometer, scraping the beds and saddles and headstock bearings of lathes, scraping and bedding down slides of radial drills, erecting lathes and fitting and assembling counter-shafts, etc.

The operations now undertaken by women in the production of shells and fuses cover practically the whole manufacture of the smaller sizes and many of the larger. It is therefore needless to specify the various operations that are illustrated and exhibited.

The exhibition shows a great variety in the photographs and specimens of the parts of internal combustion engines, including parts of the Clerget, Diesel and other engines, as well as of types used in "Tanks," tractors and motor omnibuses and lorries.

Various appliances and a number of photographs are exhibited in connection with the welfare work, which is an increasingly important element in the introduction of women into industrial establishments.

By special permission of the Ministry of Munitions, the *London paper* referred to was able to reproduce photographs showing women at work in and about iron and steel works. To the stay-at-home Briton these photographs may represent strange sights, though they may recall to the globe-trotter scenes he has seen abroad, as in India, where he may witness female coolies unloading manganese ore from railway trucks with their "dulangs" (pans) on the quayside, or carrying material to fill the concrete mixer in a blockyard; or in the nearer East, where women of the Slavonic race may be seen in voluminous skirts stacking bricks or slaking lime or carrying bricks and mortar up inclined paths on to the top of high buildings in course of erection, where these primitive methods of handling material still prevail. Hitherto British women have been spared this class of manual labor, but with men wanted for other urgent work and for the colors, the women have readily responded to the call, and taken their places, making efficient substitutes in many branches of various industries.

The presence of ladies in the counting house, the tracing office, and even in the laboratory and testing room is now a familiar sight, but their services in the machine shop, the yard, and about railroad sidings bring home the far-reaching effects of the great war.

A deputation from the National Gas Council had an interview recently with the Reserved Occupations Committee, who were joined by representatives of the Ministry of Munitions and of the Director of National Service, for the purpose of discussing whether any more men could be released from the gas industry for the army and what class of men it was essential should



Women Unloading and Piling Refractories at a British Steel Plant

be exempted from military service. As a result of this interview, a classification of men is to be published, engaged inside and outside the works, covering those who should be retained at their civil occupations if over certain age limits or if not fit for "general service," and of others who should be so retained unless and until satisfactory substitutes are found, with a reservation as to the release for service of any of the men if, in the opinion of the Dilution Officer of the Ministry of Munitions, they can be replaced by women.

Women's Industrial Work Classified

To assist managers in determining the utmost extent to which they can go in the direction of employing women, the National Gas Council has published some notes, supplied by the Reserved Occupations Committee, and has added thereto a list of varieties of work upon which from their own knowledge women have already been employed successfully.

As some of the work in and about iron and steel works and in engineering shops is similar to many of the occupations in and about gas works, some of these notes are reproduced in an abridged form, and here and there suitably modified. They are in the form of replies to the general query: "Can women be employed, and if so to what extent, in the undermentioned occupations?" and are as follows:

Coal Handling.—Unloading ships and barges with grabs or skips worked by cranes.—Barges can be emptied by women, who can fill skips and wheel away. Handling grabs is not suitable work for women; but they can be employed as crane drivers.

Unloading of railroad cars.—Women are successfully employed in emptying railroad cars. Operating self-tippers and capstans might also possibly be done by women. Small shovels and suitable clothing are essential.

Weighing.—Quite suitable, except where the position of the weighbridges makes it undesirable.

Pushing and tipping trucks.—Yes, in most cases.

Attendants on coal conveyors, elevators, and breakers.—Yes, in some cases.

Filling trucks by shovel.—Yes.

Coke Ovens.—Handling of hot coke, quenching, and trimming.—No.

Attendants on coke conveying, elevating, and screening plants.—Yes, in some cases.

Coke Handling in Yard.—Filling sacks from hoppers or with forks.—Yes.

Stacking sacks on vans.—Yes, if the sacks are not too heavy.

Filling trucks, carts or barrows.—Yes.

Weighing.—Yes.

Sack repairing.—Yes.

Coal picking and washing, and bagging.—Yes.

Wheeling from coke breakers.—Yes.

Coke-crushing machine.—Yes.

Screening and Packing Breeze.—Yes, where the work is done by hand. Where it is done by machine, the man in charge is sometimes a "handy-man," capable of doing repairs, who could not be replaced by a woman.

Engine-room Attendants.—Cleaning, and as assistants.—Yes. Not in charge.

Time Keeping.—As assistants.—Not in charge, except in small works. Yes, as a rule; not where the "assistant" is responsible for the keeping of complicated wage records.

General Laboring.—Such as sweeping-up, tarring and painting, cleaning firebricks and general cleaning.—Yes. Cleaning windows by women is regarded as summer work only in some works.

Scraping, Tarring, and Painting.—Yes. Summer work only.

Lacquering and Polishing.—Yes, with skilled male supervision.

Skilled Repair Staff.—Bricklayers, carpenters, engine-fitters, etc.—No. As mates to above.—Yes, in many cases.

Workshops.—Women can attend to drilling, planing, and shaping machines and lathes; also for simple work on vice. They have been successfully employed in munition factories, particularly where the work is of a repetition character. Tool-setters and a skilled overlooker are, however, necessary. The suitability of the work for women would depend upon the kind of work being done; and this varies greatly between large and small works.

Works Testings.—Routine tests.—Yes, under skilled supervision, and after a few months' preliminary training.

Storekeeping.—Yes, to a large extent.

Driving Light Motor-Wagons, etc.—Yes.

Other Work.—Attending sulphate of ammonia plant.—Yes, as assistants and for bagging sulphate.



British Women Unloading and Stacking Limestone at Air Blast Furnace Plant

Concentrated ammonia plant.—Yes, for watching gages and temperature to regulate steam.

Tar Distillery.—Yes, for cleaning pitch bays and bagging methylene crystals.

A New Permanent Magnet Steel Containing Chromium

What would probably be exploited as a wonderful substitute alloy steel, if made in Germany, has been quietly and successfully produced by two or three American steel makers for over a year. It is a new magnet steel as a substitute for the older product of tungsten steel.

Not long after the war started and the price of tungsten advanced, efforts were made to find a steel that would be cheaper and also as efficient as the permanent magnet steel then being used, containing anywhere from 5 to 10 per cent tungsten and sometimes even up to 25 per cent. The demand was insistent from both magneto makers and electric companies making meters, because the tungsten magnet steel was reaching prohibitive prices. It was even stated that automobile makers were substituting batteries instead of magnetos because American steel makers could not make as good magnet steel as foreigners, manifestly an incorrect statement.

The new steel, which is reported to be not less than 90 per cent as efficient as the old permanent magnet steel, is a 0.90 per cent carbon steel containing about 2 per cent of chromium and is now being made in electric furnaces in this country and extensively used by many consumers.

This new type of steel is based on investigations made by Dr. John A. Mathews, president Halcomb Steel Co., Syracuse, N. Y., and published by the American Society for Testing Materials about three years ago, in which it was pointed out for the first time that certain types of steels are better magnetically when quenched in oil than when quenched in water. This statement was entirely contrary to all previous ideas regarding the hardening of steel for permanent magnets.

Magnetically this new chromium steel is equal to tungsten magnet steel in permanence and somewhat lower in residual density. Users have found it possible to substitute it for the older steel without making any change whatever in their windings or in the cross sections of the magnets used.

Practically chrome magnet steel, as the new steel is called, is not as good as the tungsten magnet steel, because it requires oil hardening, which is not as convenient as water hardening and also because chrome steel in its natural state is much harder to drill or machine and the steel itself must be handled with greater care and uniformity in heat treatment than is necessary with tungsten steel.

A large electric manufacturing company in this country has this to say regarding the new steel: "We have been using this material for permanent magnets

for some time past. By close co-operation with the manufacturers of the steel and careful development of the necessary methods and processes for its treatment, we have obtained results which are entirely satisfactory."

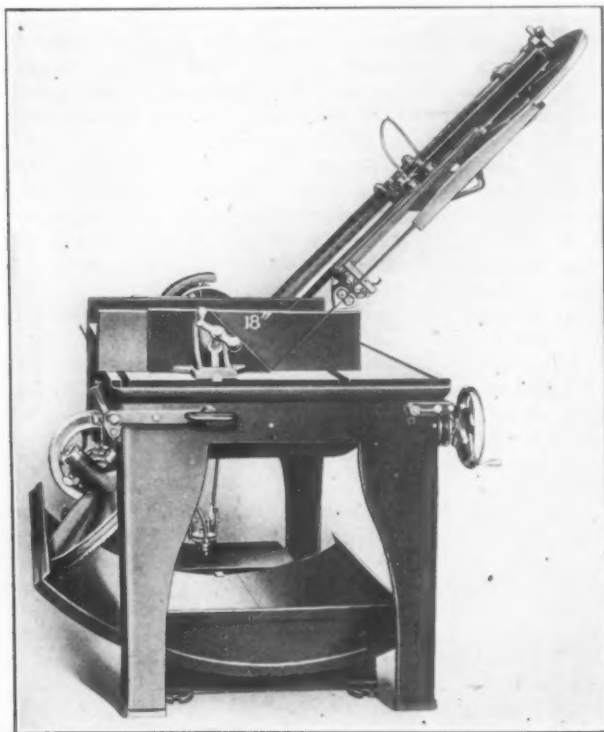
Universal Metal Cutting Band Saw

A band saw in which the blade can be tilted to a maximum of 45 deg. on either side of the vertical has been brought out by the Armstrong-Blum Mfg. Co., 333 North Francisco Avenue, Chicago. The design of the machine is somewhat unusual and is said to provide for easy operation and a wide range of work.

The saw blade is mounted on two flanged wheels supported by a frame which is carried on pivots in a cage under the table. The wheels may be tilted to alignment with the saw blade. The cage supporting the blade frame has four hardened roller bearings and the rollers which guide the blade are of the double ball bearing type with dirt-proof felt oil rings.

The saw table is 32 x 60 in. and is provided with four $\frac{3}{4}$ -in. T slots, the two in the center being machined and notched to accommodate the jaws of the vise. These jaws are 6 in. high and 12 in. wide and can be shifted quickly to give a maximum opening of 18 in. It is possible to reverse the jaws and shift them from one of the center slots to the other, or remove them entirely if it is desired to fasten fixtures or pieces of unusual shape directly to the table.

The feed is controlled by a thumb lever at the front of the machine, the pressure being transmitted to the saw blade through a bronze worm gear with cork inserts, two friction disks, a spring and an adjusting nut. A handwheel is employed for manual operation of the feed. The swinging of the blade is easily accomplished, a set of graduations being provided to



Right or Left Miters Up to a Maximum of 45 Deg. Can Be Cut by Tilting the Band Saw Blade and Guide Wheels while Straight Work Is Handled in the Ordinary Way

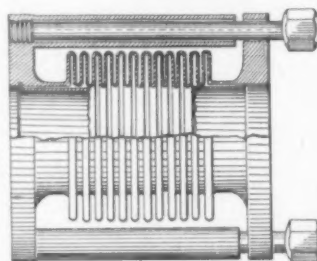
indicate the exact angle at which the blade is tilted. The machine can be stopped at any required depth of cut by varying the position of the knock-off dog.

A centrifugal pump located underneath the table and driven by a belt from the main shaft forces lubricant to the blade at the point of cutting. The lubricant that drips down is caught by a telescoping pan which is relied upon to catch all the surplus regardless of the position of the saw blade.

Belt drive is regularly provided, together with a pump and connections and pan. If desired the machine can be furnished for dry cutting and also with motor drive.

A One-Piece Machined Expansion Joint

As a substitute for loops and U-bends and stuffing box and long sweep expansion joints, the R. D. Nuttall Co., Pittsburgh, has brought out a one-piece joint.



Machine Finished Corrugations Are Relied Upon to Take Care of the Expansion or Contraction of a Pipe Line

The action of the joint is similar to that of an accordion or bellows, limiting bolts being provided to prevent expansion beyond the safe limit.

The joint is made from a solid hammer forged steel blank and the corrugations are machined both inside and out. It is emphasized that great care has to be taken in doing this work, and after it is completed

the blank is tempered in oil. Packing has been eliminated and it is emphasized that the possibility of leakage has been done away with, as well as securing a joint which is readily responsive to slight changes in the length of the pipe line of which it forms a part and capable of withstanding high pressures. The joints are made for use on high pressure piping ranging from 4 to 18 in. in diameter and for low pressure work the pipe sizes range from 20 to 48 in. The high pressure joints have a total movement of 2 in. while that of the low pressure joint is $\frac{1}{2}$ in. Standard flanges are provided for both classes of joints.

A breakdown test of a corrugated copper joint and one of the type illustrated was made under similar conditions to determine the comparative life. The number of expansions for which the copper joint lasted was 28, while the steel joint had a life of 950 expansions.

Government Shops to Cost \$7,500,000

Secretary of the Navy Daniels is asking Congress for an appropriation of \$7,500,000 to increase the capacity of the Washington Navy Yard, where the big guns for the navy are finished and assembled. New shops for the navy are to be built for the manufacture of guns, mounts, torpedoes, mines, telescopes, sights, optical instruments and miscellaneous ordnance supplies. It is planned to spend \$5,000,000 on new buildings and \$2,500,000 for machinery. The Secretary said:

Contracts for guns, mounts and other ordnance supplies are becoming increasingly difficult to place. The proposed work includes the construction of a large six-story machine shop for mines, mounts, and torpedoes; a five-story pattern and woodworking shop, an extension to the power plant, a new brass foundry, an extension of the steel forging plant, an optical shop, range finder towers, administration building, quarters for enlisted personnel under instruction, and the extension of the yard service system to supply adequately these new structures.

With the accomplishment of the extensions contemplated, ample manufacturing facilities will be provided for the manufacture of from 300 to 900 torpedoes per annum, at least 3000 mines per month, a large increase in the manufacture of guns, mounts, and other ordnance accessories, and the manufacture and repair of the larger part of the optical work for the entire naval establishment.

The Youngstown Sheet & Tube Co., which has 55 puddling furnaces at East Youngstown, Ohio, and the A. M. Byers Co., Inc., Pittsburgh, which has 88 puddling furnaces at Girard, Ohio, will both pay the Amalgamated rate of \$12.80 per ton for boiling for July and August. Both these plants are operated non-union, but have always paid the Amalgamated rate or a higher rate.

Under a compromise agreement, about 3000 employees of the National Conduit & Cable Co., Hastings-on-Hudson, N. Y., have returned to work after being out on strike. The men will receive an advance of two cents an hour, with nine-hour day. The men sought an eight-hour day. Machinists at the plant have received an increase of 3 cents an hour.

TRADING WITH THE ENEMY

Elaborate Provisions in Regard to Patents and Other Matters in Pending Bill

WASHINGTON, July 23.—A measure of far-reaching consequence to the business men of the country, forbidding trade intercourse with the enemy under severe penalties and providing for the conservation of the property of enemy aliens in the United States, has been passed by the House and is about to be reported by the Senate Commerce Committee, with the expectation that it will become a law within the next 30 days. The bill is based upon the doctrine of Anglo-American law that one of the immediate consequences of war is the interdiction of commercial relations between the citizens or subjects of the belligerent nations, with certain negligible exceptions covered by special licenses.

The trading with the enemy bill, as it is called, defines the word "enemy" to be (a) any individual, partnership, or other body of individuals, of any nationality, resident within the territory (including that occupied by the military and naval forces) of any nation with which the United States is at war, or resident outside the United States and doing business within such territory, and any corporation incorporated within such territory of any nation with which the United States is at war or incorporated within any country other than the United States and doing business within such territory; (b) the government of any nation with which the United States is at war, or any political or municipal subdivision thereof, or any officer, official, agent, or agency thereof; and (c) such other individuals, or body or class of individuals, as may be citizens or subjects of any nation with which the United States is at war, wherever resident or wherever doing business, as the President, if he shall find the safety of the United States or the successful prosecution of the war shall so require, may, by proclamation, include within the term "enemy." Allies of the enemy are included in the same general category.

The term "to trade," as employed in this measure, is given a very broad significance, including all the following transactions: "(a) pay, satisfy, compromise, or give security for the payment or satisfaction of any debt or obligation; (b) draw, accept, pay, present for acceptance or payment, or indorse any negotiable instrument or chose in action; (c) enter into, carry on, complete, or perform any contract, agreement, or obligation; (d) buy or sell, trade in, deal with, exchange, transmit, transfer, assign, or otherwise dispose of, or receive any form of property; or (e) to have any form of business or commercial communication or intercourse with." It is made unlawful by the bill for any person in the United States, except with a license from the Secretary of Commerce, to trade or attempt to trade with an enemy or with an ally of the enemy or to transport an enemy or an ally of the enemy.

All persons coming within the category of enemies or allies thereof, including individuals, partnerships, corporations, etc., are forbidden to assume or use any name other than that employed at the beginning of the war, except by special permission.

To provide for the conservation of the property of enemies and allies of enemies and to enable citizens of the United States to discharge obligations thereto, the Secretary of Commerce is authorized to appoint an official, at a salary not exceeding \$5,000 per annum, to be known as the alien property custodian, who will be empowered to receive all money and property in the United States due or belonging to an enemy or ally of an enemy.

An important feature of the trading with the enemy bill is an elaborate provision with respect to the patent rights of enemies and allies thereof and the privileges bestowed upon American citizens to manufacture during the war articles covered by patents held by enemies or their allies. Applications for letters patent or for registration of trademark, print, label, or copyright may be filed and prosecuted in the United States by an enemy or ally thereof. Any such person who is unable during the war, on account of conditions arising out of

the war, to file such application or to pay the official fees, may be granted an extension of nine months after the war "provided the nation of which said applicant is a citizen, subject or corporation shall extend substantially similar privileges to citizens and corporations of the United States." Any citizen of the United States, or any corporation organized therein, may pay to an enemy or ally thereof any tax, annuity or fee in relation to patents, trademarks, prints, labels and copyrights.

The use of enemy-owned patents or copyrights during the war is provided for in detail. Licenses are to be issued by the Federal Trade Commission.

The money paid to the alien property custodian by the licensee is not to be turned over to the owner of the patent or copyright until the latter has secured a judgment upon filing a bill in equity in a District Court of the United States for the recovery of royalty. Should no action be brought within one year after the end of the war, the licensee will be entitled to receive back all funds deposited by him with the alien property custodian.

It is not the purpose of the pending measure to provide a method for the distribution after the war of money or other property acquired by the alien property custodian and it is expressly stipulated that all law claims to any such money or property "shall be settled as Congress shall direct," the object being, presumably, to provide merely for the conservation of enemy-owned property during the war, its final disposition to be determined in accordance with the terms of the peace treaties by which the war is concluded and the reciprocal legislation enacted by the signatory powers in pursuance of such conventions.

Severe penalties for the wilful violation of the proposed law or of the provisions of any license, rule or regulation thereunder are provided by the bill, including fines not to exceed \$10,000 or imprisonment for not more than ten years, or both. The Secretary of Commerce is authorized to create a division in his Department for the execution of the law and an appropriation of \$250,000 is made for the payment of salaries of all persons employed therein.

W. L. C.

The World's 1916 Copper Output

The world's production of copper in 1916, according to a recent issue of Pester Lloyd, was 1,396,600 tons as compared with 1,061,300 tons in 1915, an increase of 335,600 tons. The 1914 output was 923,909 tons and that of 1915 was 1,066,000 tons. Of the 1916 total 880,880 tons is credited to the United States; this was 556,000 tons in 1913. (The U. S. Geological Survey recently estimated the U. S. production of smelter copper for 1916 at 1,927,850,848 lb. or 860,647 gross tons.) Next in importance ranks Japan with 90,000 tons in 1916, followed by Chile with 66,500 tons and Mexico with 55,000 tons.

Changes in Roebling Co.'s Selling Organization

Ira J. Francis has been appointed Pacific coast sales agent, with entire charge of the selling organization of the John A. Roebling's Sons Co., of California. His headquarters are at 646 Folsom Street, San Francisco. For the past 16 years he was manager of the Los Angeles branch of the company, and will be succeeded by J. N. Colkitt. S. W. Gilman, who was formerly assistant manager of the San Francisco store, has been placed in charge. No changes have been made in the management of the Portland or Seattle branches, which are in charge of L. H. Parker and W. F. Richardson, respectively.

The Aborn Steel Co. will build a one and two-story warehouse and office building on the site recently purchased at 22 Clarke Street, New York. The cost will be about \$18,000. The company will occupy the new building about Oct. 1, 1917, and will enlarge its warehouse stock of high speed steel, carbon tool steel, spring steel, music wire, drill rods, alloy steels, shafting, etc. Branch offices will be at 269 Drexel Building, Philadelphia, and 133 Andrews Street, Rochester, N. Y.

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Regulation of Prices or Conditions?

While the steel making and consuming industries were kept on the anxious seat during the pendency of the food bill in the Senate, in doubt whether or not a provision for iron and steel-price regulation would be part of the measure as finally enacted, and while the President's "one-price-to-all" suggestion of a fortnight ago increased the uncertainty, the iron and steel market without any ado quietly settled the matter itself. It simply stopped. When it resumes it will be with the full consent and approval of the buyers. That has not been their attitude or frame of mind during the major portion of the spectacular price advance of the past year and a half. By the end of 1915, when steel prices reached the top level that had been attained in 1907, steel buyers had reached the position of buying under protest. They were actuated by fear rather than judgment, and simply hoped that in buying they were choosing the lesser of two evils.

When steel buying stops, it requires a great deal of force to start a fresh movement. In the past there has always been a drastic readjustment of prices together with a period of greatly restricted production. No restriction of output through lack of orders can be considered, in the present temper of the trade, as even a remote contingency during the war, though perhaps stranger things have occurred. As to a readjustment in prices, it is a matter of opinion whether there exists to-day a set of prices which can be regarded as "the market" and from which a readjustment would proceed. The rational view would seem to be that there is no semblance of a regular forward delivery market, hence when a fresh buying movement starts the price structure will simply be a new one.

One of the objects of the lights in Washington who desired iron and steel price regulation was to prevent a market runaway due to the Government taking so much material out of the situation. At the moment no such need exists. The market is not running or even walking. Another argument in favor of price regulation was that there was danger of some consumers being put out of business, either through some being less fortunate than their competitors in buying

ahead, or through all yielding to the desire to be "protected" and undertaking to pay higher prices for steel than the market for their finished wares would eventually justify. However, if the steel market continues a sufficient time in its present state, such dangers will be largely removed. When buyers resume buying in a large way they will do so with their eyes open.

Government dictation of prices for the iron and steel industry would have certain definite effects, but it would not be remedial in its action. With the free operation of the law of supply and demand and with free and unlimited competition (among buyers) prices of pig iron, coke and various finished steel products have been made to occupy very curious relations to each other, the relations changing from time to time. Two years ago Connellsville furnace coke sold at less than one-eighth the price of basic pig iron at Valley furnaces. One year ago, with all prices higher, it sold at one-seventh the price of pig iron. At the beginning of this month, with pig iron quadrupled in value, coke sold at two-sevenths the pig-iron price. The relation between pig iron and billet prices has changed in equally anomalous fashion. Billets have brought more than wire rods, wire rods more than wire nails, skelp more than pipe, and galvanized sheets more than spelter.

To dictate harmonious prices would not be difficult, so far as concerns the making up of a logical schedule, but that would not remove the fundamental conditions that have disarranged the market. Certainly it is reasonable to assert that if the Government were to undertake to smooth out conditions, whereby the free play of market conditions would produce reasonable and logical prices, it would be doing a much better work than the mere dictation of prices. As to coke, the greatest offender in both price and supply, there is no scarcity of productive capacity, but rather a considerable excess. It is merely a case of car and labor supply. With its great powers the Government should be able to apply a remedy. With cheaper coke there could be cheaper pig iron, and with more coke there would be more pig iron. If still there were not enough pig iron, the Government should be able to expedite the erection of blast furnaces. In the matter of finished steel products there has been opportunity, entirely neg-

lected thus far, for the Government to cause an increase in the production of the classes particularly required. A wooden ship program was put forward, partly because ship plates and the facilities for building enough steel ships were not available. Then, by hook or crook the steel mills were required to find plates for steel ships, which they could do only by taking the plates from other consumers. Then came a plan to build a large number of freight cars to be leased to the railroads, with more plates still, and these could not be found. There was no one to take them from. Three months ago the Government could have exercised its influence to provide material and equipment for the building of slabbing and plate mills, which could have been built in relatively short order with the necessary influence.

Of prime importance in bringing about a better supply of all needed commodities in the iron and steel industry is the matter of labor. There is a shortage in the number of men and a lack of adequate performance on the part of those holding jobs. If the materials are essential to the conduct of the war, it is difficult to see why the Government is not as free to call upon men to work as to call upon them to fight.

It may be possible, by educational work, to bring about a realization that more effective work can be done toward establishing rational market conditions in iron and steel by stimulating the operations of production than by dictating prices.

Government Help on Labor

In England the government and industry have obtained the co-operation of labor to such an extent that production has been increased despite the sending of several million men to war. The use of female labor in places left by men is but one factor in this result. In the United States labor has not awakened to the seriousness of the situation confronting the nation. While the results in England have come largely by government effort, the officials at Washington have adopted a "hands off" policy so far as concerns aid to manufacturers in providing sufficient labor.

One of the most serious obstacles to maximum production, as has been pointed out many times, lies in the inclination of many workmen to labor only as many days a week as is necessary to secure a living. In England it is a violation of the defense of the realm act for a workman or business executive to absent himself without good cause from any work in which the government has an interest, willfully to miscarry instructions, or to impede production in any way.

Our shipbuilding industry illustrates glaringly the lack of co-operation on the part of labor. Several of the large yards which are building warships and merchant vessels not only are handicapped by an insufficient number of men, but are unable to get full performance from the men they have. A yard on the Delaware employs 5000 men and could use 2500 more. Meanwhile instructions come from the Secretary of the Navy to "speed up." Bonuses have been offered to the men for overtime and Sunday work. Some of the workmen will work on Sunday for double-time pay and "lay off" on Monday, so that actual production is not increased but

costs are. In fact, this disposition of the workmen to take one or two days off every week in addition to the Sunday rest is a problem that may only be solved by government action.

Shipbuilders have gone to Washington to get advice on methods of increasing the number of workmen and preventing waste of time, but the attitude of shipping authorities there is that they have troubles enough on their hands at present without taking up the labor problem. Nevertheless shipbuilders are convinced that something in the nature of conscription of shipbuilding labor must eventually come if our ship program is to be a success. They have regarded the labor question as of even greater seriousness than the differences in the Shipping Board and the Emergency Fleet Corporation. That trouble has at last been settled by the President's belated action, but the present attitude of labor threatens the activities of the government throughout the war unless decisive steps are taken.

Steel Profits by Processes

In any scheme of price fixing in the iron and steel industry, the difficult matter, once the total profit is fixed, is to distribute this along the line—to determine how much should go to the iron mine, how much to the coke works, how much to the blast furnace, and so on. Should the Government undertake to regulate prices at which all finished steel should be sold, it would be absolutely essential to make this distribution. Even in the case of the steel purchased directly by the Government this must be done, for amid the many uncertainties surrounding the Government program, if there is one, there has been one unequivocal statement, that orders for steel are to be distributed among producers according to their steel making capacity.

Prices made to the Government thus far on plates, shapes and bars have been much lower than those obtainable in the open market. It would be manifestly unfair to expect a concession from the steel mill that purchases its pig iron and expect nothing from the blast furnace which supplies the pig iron. That would be tantamount to saying that if a capitalist has elected to invest money in a merchant blast furnace, in a coke works or in an iron mine, he has no duty to the Government—he can go ahead and make all the money the market suggests possible; but if he has elected to put his money in open-hearth furnaces with a plate mill then he has a great duty to his country and must cheerfully make sacrifices.

The injustice of the procedure would be made the greater if the price of the finished steel were determined by the cost showing of the integrated companies, whose profits would be automatically telescoped so far as the Government was concerned.

In 1916 the portion of the total output of Bessemer and basic iron, ferromanganese and spiegeleisen that was sold, not consumed by the producer, was 14.3 per cent. A small portion of this material was sold for iron and steel foundry use and for the manufacture of ingot molds, which were bought by some steel producers while others made molds from their own pig iron. On the other hand, the steel makers who buy pig iron generally use a larger proportion of scrap than those who produce their pig iron. Thus

it may be said that about 15 per cent of the steel produced is made from purchased raw materials.

The proportion of the total coke consumed that is purchased by blast furnaces has been decreasing rapidly with the erection of by-product ovens at furnace plants, and probably lies at present between 20 and 25 per cent; but as the blast furnaces producing foundry iron purchase a larger proportion, those producing iron for steel making purchase a smaller percentage, perhaps not far from 15 per cent.

The proportion of the total iron ore that is purchased is not readily computed, because many furnaces are part owners of iron mines. Thus, if the total output of iron ore were 100,000,000 tons and a blast furnace should purchase 200,000 tons from an ore company in which it had a one-half interest, the purchase would rate as one-tenth rather than as two-tenths of one per cent of the total output. A fair guess would be that from 10 to 15 per cent of the iron ore is purchased.

A serious difficulty the Federal Trade Commission will encounter is the wide diversity of practice in cost finding. Moreover, there is **no fixed rule**, or anything approaching a common practice, as to the allotment of profits to the different operations, and this is true even though the subject is a very familiar one. The integrated companies have it with them all the time, as it is necessary in their accounts to show what profit each department is making. More often than not the inter-company or inter-department price that is used in making up the accounts is less than the open market price; very rarely is it higher. In this there is tacit recognition of a general principle, that in market movements the raw and intermediate products are prone to advance by a greater proportion than the finished product which is sold to the public outside the steel making industry, and thus further emphasis is laid upon the necessity of fixing prices on the raw and intermediate products if a price is fixed for the finished product.

If capital that is invested in one branch or another of the iron and steel industry is entitled to a fair return, irrespective of which branch the investor has selected, then the markets in the past two years have inflicted greater injustices than could be compassed by the veriest tyro in price fixing. Some of these injustices, however, have been tending to equalize. For instance, while billets advanced \$30 a ton, pig iron advanced only \$5, but lately pig iron has been having its inning. Again, Lake Superior iron ore at mine is this season bringing no more than about double its lowest price in the past ten years, whereas Connellsville coke has sold at as high as \$14 to \$16 a ton at ovens, against previous low prices of \$1.40 or \$1.50, or at ten times the low price instead of twice. The market does not correct this divergence, which is all the more unreasonable from the fact that the ore company has sunk large sums of money in development, to be returned at best over a period of many years, while less than two years ago there was good ground for the Connellsville coke operator to believe that the development of the by-product industry had eliminated all prospect of even moderate profits in future.

The fixing of prices for finished steel involves the question how much money an integrated steel producer should earn in the circumstances. It is a diffi-

cult question, but not one of accounting methods, the accounting merely determining the application of the rule once laid down, as to profits. The allotment of profits among the different processes is a much more difficult one, and it is one that has been studied only by the accountants of the integrated producers. To the national question they could not apply their own rules, and it is certain that they have not been agreeing with each other in actual practice; but it is they who should be called upon for advice and suggestion as to how the allocation should be made, so that if a burden is to be borne the distribution throughout the industry should be fair and equitable.

Some Results of Co-operation

The splendid results of co-operation in improving the efficiency of the railroads and other means of transportation in this country are already being demonstrated in a most impressive manner. On the Great Lakes, a very poor showing was made for some time after the opening of the season owing to the unusually cold weather and other causes, but under the plan of co-operation of iron ore, coal and vessel interests which has been working harmoniously, shipments have increased to such an extent that it now seems probable that as much ore will be shipped from the Lake Superior mines this year as was handled in the record breaking year 1916.

The operations of the War Board under which the railroads of the country have been managed jointly show a surprising increase in the freight handled. In a circular which has just been issued by the board, it is stated that although only about half of all the mileage had been heard from at the time of the report, it was known that this fraction had produced, for the public, more than 3,000,000,000 ton-miles more of freight transportation in April, 1917, than in the same month of 1916. There was shown an increase of 66 tons or 10.4 per cent per train and 2.4 tons or 10 per cent per average lading of cars, equivalent to an addition of 126,000 cars to the equipment of the roads reporting. There was an increase of 16 per cent in the one month in the mileage covered by the report, the equivalent of adding 35,000 miles of railroad to the lines in the United States. Cars have been more fully loaded, roads having an abundance of equipment have been ordered to turn over cars to roads needing them and the car shortage has been greatly reduced.

The showing which has been made by the Railroad's War Board is being highly praised, but some critics do not understand why the work was so long delayed. For example, the *Evening Sun*, New York, says: "Cordial praise is due to the railroads and their clients who are co-operating with them. Only one word of criticism suggests itself at the moment; simply this: Why in the world did they wait for war to wake them up and put these economies in operation?" The fact is that the railroads, like many other lines of activity, did not co-operate because they were afraid to do so. As long as the Sherman law and many other national and state laws remained on the statute books and attempts were being made to enforce them, manufacturers and other business men were in danger of going to prison if they acted in harmony. They

did not wait for a war to wake them up, but the war is waking the country up to the wonderful possibilities of co-operation.

Our Half-Yearly Index

The index of THE IRON AGE for the past half year, January to June inclusive, has been compiled and printed and is now ready for distribution. It will be forwarded promptly to those who have entered their names on our list as desiring it. Others who may have use for copies can secure them by addressing our Circulation Department.

HEAVY WAR DEMANDS

Secretary Daniels Asks for Large Additional Appropriations

WASHINGTON, July 24, 1917.—The Secretary of the Navy has transmitted estimates to Congress calling for \$137,366,000 additional for the war needs of the Navy, including guns, ammunition, ordnance supplies, improvements of the yards and docks and the substantial enlargement of the naval gun factory in Washington. The largest item is \$105,566,177 for the naval establishment which includes \$12,446,000 for procuring, manufacturing and handling ordnance material and for the armament of ships; \$25,000,000 for procuring, manufacturing and handling ammunition for vessels; \$22,000,000 for batteries and outfits for naval vessels, patrols, aircraft, merchantmen, etc.; \$30,000,000 for reserve and miscellaneous ordnance supplies and \$12,000,000 for repairs, preservation and renewal of machinery in accordance with the plans of the Bureau of Steam Engineering.

The sum of \$5,000,000 is to be spent in the enlargement of the Washington Navy Yard to increase its capacity for the production of guns, mounts, torpedoes, mines, optical instruments and miscellaneous ordnance supplies. The necessary buildings, craneways, storage and handling facilities will absorb the sum mentioned, while the requisite machinery will cost \$2,500,000 additional.

A separate appropriation of \$23,400,000 to be expended by the Bureau of Yards and Docks is requested by the Secretary, the chief items being as follows: For the construction and equipment of training camps \$12,600,000, for heavyweight handling appliances at navy yards \$1,650,000, for marine railways at navy yards and stations \$500,000, and for improvements at stations for the Bureau of Ordnance \$3,950,000.

W. L. C.

New Mill Approaching Completion

The blooming mill of the new plant of the Keystone Steel & Wire Co., Peoria, Ill., was started July 13. Two open-hearth furnaces began operations May 20 and 21, and a third is now building. The rod mill will be ready to begin in about four weeks.

The Anaconda Copper Mining Co. has selected a site for a rod and wire mill to be built at Great Falls, Mont., and it will be ready for operations next spring. Machinery has been ordered. The new mill will be housed in a building 400 x 125 ft., of brick and steel construction. The capacity of the mill will be 200,000 lb. of copper rods and 85,000 lb. of copper wire, working on eight-hour shifts. The investment will be about \$500,000.

The American Locomotive Co. has commenced the dismantling of the Rogers locomotive shops, Paterson, N. J., and will distribute the machinery and equipment at its different plants. Equipment from the erecting shop will be divided between the local Cooke works and the plant at Pittsburgh. The tank shop machinery will be placed at the Dunkirk, N. Y., works.

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Opposition to Senate War Revenue Bill

Basis for Excess Profits Tax Opposed by Industries Not Prosperous in 1911-13—A Tax on the Excess Profits Tax Itself

WASHINGTON, July 24.—A battle royal is being staged in the Senate over the income and excess profits tax features of the war revenue bill, which will soon be made the "unfinished business" and will probably be debated for at least three weeks. The bill was formally reported to the Senate July 3 and subsequently withdrawn for further consideration. It has again been reported, but without any modification of the income and excess profits tax provisions which have drawn so many protests from the leading corporations of the country, and prominent Senators on both sides of the chamber are preparing to insist that important changes be made in these imposts.

The Finance Committee has reaffirmed the provision of the act of Sept. 8, 1916, which prescribed that stock dividends should be treated as income. This was a radical innovation when originally enacted and it was believed that as soon as the effect of this provision was explained to Congress it would be repealed by the new law. Attorneys for the Bethlehem Steel Co., the Lackawanna Steel Co. and other corporations appealed to the committee to amend the statute on the grounds that a stock dividend is not a dividend at all and that to levy a tax thereon would be, in effect, to tax capital and a very narrow class of capital at that. Cogent reasons were urged why a stock dividend really is not a dividend at all. It gives the recipient no money and no income that he can spend. It simply gives him something to represent his prior interest in the surplus of the corporation. As suggested by Paul D. Cravath, speaking for the Bethlehem Steel Co., if a corporation having a surplus equal to 100 per cent of its capital declares a stock dividend of 100 per cent, a stockholder has nothing more than he had before, the only change in his situation being that he has two shares of stock to represent what was represented before the division by one share of stock. With the same distribution of profits he gets the same income, but the rate per share of stock is cut in half.

Notwithstanding the arguments urged by Mr. Cravath and others, the Finance Committee has decided that stock dividends must be taxed—a decision that is likely to have an important effect upon the distribution policies of dividend-earning corporations throughout the country.

Added Tax on Earnings Carried to Surplus

An entirely new principle of taxation is exemplified in a provision of the bill added by the Finance Committee just before it was reported to the Senate. Reports had reached Chairman Simmons and his colleagues that certain corporations were preparing to assist their stockholders in evading the income tax law by carrying their earnings to surplus account, presumably with the intent to impound them until after the war when, it is probable, the income tax will be materially reduced. To meet this situation, the committee wrote into the bill a new provision, imposing upon the net earnings of all corporations, in addition to the 4 per cent income tax, a tax of 15 per cent "upon the amount remaining undistributed 60 days after the end of each calendar or fiscal year." Realizing that this provision would prove very drastic in the case of certain classes of corporations, and particularly to those requiring considerable surplus for special purposes, the committee provided that the additional 15 per cent should not apply to (1) that portion of the undistributed profits used for the establishment or maintenance of reserves required by law; (2) that portion of the undistributed profits of railroads used for extensions, renewals or betterments; or (3) an amount of the undistributed profits equal to

20 per cent of the net income of corporations (not including railroads) directly engaged in the production or distribution of commodities or in banking, but only while, and to the extent that, such exempted amount is derived from such activities and so employed.

Why Surpluses Must Be Large

The committee further provided that the 15 per cent additional tax should apply "to the undistributed net income received by every taxable corporation, joint stock company or association or insurance company in the calendar year 1917 and in each year thereafter, except that, if it has fixed its own fiscal year under the provisions of existing law, the foregoing rate shall apply to the proportion of taxable undistributed net income returned for the fiscal year ending prior to Dec. 31, 1917, which the period between Jan. 1, 1917, and the end of such fiscal year bears to the whole of such fiscal year."

Protests against this new provision have been numerous and emphatic. The charge that corporations are accumulating surplus for the purpose of enabling their stockholders to evade the income tax is vigorously denied. It is asserted that the extraordinary conditions under which business is now being conducted, with unprecedented fluctuations in demand, in prices, and in cost of material and labor, require the retention in the treasury of comparatively large surpluses; and there is no certainty that these accumulations will ever be distributed to the stockholders in the form of dividends. To tax them as possible income, therefore, it is contended, is both unfair and illogical.

A Tax on Excess Profits Tax Itself

That the Finance Committee has blundered in framing the section referred to is contended by leading corporation lawyers, who point out that the language of the provision will result not only in a tax on undistributed surplus, but upon the excess profits tax imposed by the pending bill. This contention, which is of interest to every corporation in the country, is set forth by a Boston attorney, whose letter has been filed with the Finance Committee by Senator Weeks of Massachusetts, in part as follows:

Under the language above quoted a corporation must pay a 15 per cent tax upon the excess profits tax itself. This could not have been the intention of the framers of this section. The purpose of the section obviously is to prevent stockholders from avoiding an income tax by leaving earnings undistributed in the treasury of the corporation.

Now, in the aggregate of the previous year's income undistributed at the end of 60 days, you will inevitably find not only what might properly be distributed to the stockholders as dividends, but also you will find the amount of the excess profits tax imposed upon the previous year's earnings not yet paid, for it cannot be paid until the middle of the year. The effect of the section is, therefore, to impose the excess profits tax and then in addition to impose a tax of 15 per cent upon the excess profits tax itself.

To make this situation concrete, we take the figures of a corporation with an average earnings during 1911, 1912 and 1913 of \$180,000, and with net earnings in the year 1917 of \$1,500,000. The excess profits tax under the above conditions will amount to \$582,870. Assume that the corporation distributes \$500,000 in dividends; it has been left \$1,000,000 upon which to reckon the 15 per cent tax imposed by the language quoted above. It is allowed to deduct 20 per cent of its net income, if utilized in its business, leaving \$700,000 subject to the tax. Now, out of this \$700,000 it must pay later in the year the excess profits tax of \$582,870, leaving only \$117,130 of accumulated profits tax, to which the 15 per cent tax should properly be applied. As a matter of fact, the language quoted above makes the 15 per cent tax applicable to the whole \$700,000, so that the 15 per cent tax amounts to \$105,000, and takes all of the balance except the meager sum of \$12,130.

The corporation went further and distributed in the form of dividends all its earnings except the excess profits tax

and the 20 per cent which it is allowed to retain in reserve, it would have to pay this additional 15 per cent tax out of the 20 per cent which would be *reductio ad absurdum*.

This mix-up comes from applying to the excess profits tax the same principle which is applied in the act to the income tax itself. One may argue properly enough that, in figuring the income and excess profits tax for any year, the amount of tax paid out of that year's earnings on account of the income of the previous year should not be deducted, but there is no sense in applying this principle to this additional 15 per cent tax.

Notwithstanding the fact that several Senators have drawn the attention of the Finance Committee to this form of double taxation, Chairman Simmons expresses the opinion that the committee will resist its elimination from the measure. The section referred to was drafted by the Internal Revenue Bureau and during the interval after the bill was recommitted the Finance Committee discussed it at some length, but decided not to modify it, and it remains intact in the measure as finally reported to the Senate.

Opposition to Excess Profits Tax

The radical change in the basis for the assessment of the war excess profits tax adopted by the Finance Committee is now being energetically opposed by corporations that have calculated the effect of the change. They find in some cases that it means a doubling or even trebling of the tax levied under the House provision, which imposed a rate of 16 per cent on all earnings in excess of 8 per cent plus \$5,000. The Finance Committee rejected the House provision in toto, adopting in its place the English system, with slight modifications, basing the tax on the profits currently earned as compared with the average earnings during the three calendar years 1911, 1912 and 1913, denominated in the bill the "pre-war period." On the excess profits thus determined the rates range from 12 per cent on profits not exceeding 15 per cent, up to 50 per cent on profits which exceed 250 per cent.

Protests against this provision are based upon several counts. In the first place, while the bill provides that if a corporation or partnership was not in existence during the whole of the pre-war period the portion of such period during which it was engaged in business may be taken as the basis for the tax, the measure does not contemplate at all the status of many corporations which have been organized since the beginning of the war and which have done a very large war business. In the second place, the contention is made that the rates of tax to be imposed upon the excess profits to be determined as provided in the Senate bill will impose far heavier burdens upon moderately successful corporations than the rates as fixed by the House measure. On this account much pressure will be brought to bear upon the Ways and Means Committee to stand out against the adoption of the English system in conference if the action of the Finance Committee is indorsed by the Senate.

Iron and Steel Trades Affected

Perhaps the strongest protest against the adoption of the English basis for calculating excess profits has come from corporations which suffered several years of depression prior to the war, especially in 1912 and 1913 when Congress was engaged in revising the tariff and in enacting other legislative measures restricting the operations of corporations in all lines of business. The iron and steel trade suffered severely during the pre-war period and it is obvious that a comparatively high rate of tax levied on all earnings in 1917 in excess of the average of 1911, 1912 and 1913 will impose heavy burdens on this industry and on all others similarly circumstanced. The suggestion has been made that the pre-war period be extended to include the ten years from 1903 to 1913, which, in the case of certain industries, would give a higher basis for comparison with current earnings and would, therefore, result in lower aggregate taxes. The Finance Committee has not been greatly impressed with these suggestions, however, and, being determined to exact liberal contributions from corporations that have prospered during the war, will resist all efforts to change the system adopted.

W. L. C.

INSTITUTE OF METALS

Tentative List of Papers to Be Read at the Meeting in Boston

The tentative program for the meeting of the American Institute of Metals, to be held Sept. 25-28, at Boston, has been issued. Separate sessions will be devoted to the discussion of crucibles and furnaces, the melting and casting of nonferrous metals, casting in connection with munition making, the testing of nonferrous metals and metallography. The tentative list of papers is as follows:

Crucibles and Furnaces:

"The Crucible Situation," by Prof. A. V. Gleininger, Bureau of Standards, Pittsburgh.

"Melting Yellow Brass in New Form of Induction Furnace," by G. H. Clamer, Ajax Metal Co., Philadelphia.

"The Crucible Situation," by M. McNaughton, Joseph Dixon Crucible Co., Jersey City, N. J.

"The Electric Furnace and Nonferrous Metals," by Dwight D. Miller, the Society for Electrical Development, New York.

"My Experience with Metal Melting Furnaces," by W. H. Parry, National Meter Co., Brooklyn.

Melting and Casting Nonferrous Metals:

"Casting Bearings in Sand and Metal Molds," by R. R. Clarke, Pittsburgh.

"The School End of the Job in Training Foundrymen," by C. B. Connelly, Dean, Carnegie Institute of Technology, Pittsburgh.

"The Flux and Cleaner Question of Brass," by E. A. Frohman, S. Obermayer Co., Pittsburgh.

"Negative Experiments on Waste Core Sand," by Dr. H. W. Gillett, Bureau of Mines, Ithaca, N. Y.

"Pyrometers—Their Construction and Application," by John P. Goheen, Brown Instrument Co., Philadelphia.

"Surface Tension and Deoxidizing of Metals," by W. J. Knox, Metals Deoxidizing & Refining Co., New York.

"The Briquetting of Nonferrous Light Metal Scrap," by A. L. Stillman, General Briquetting Co., New York.

"The Swelling of Zinc Base Die Castings," by H. M. Williams, National Cash Register Co., Dayton, Ohio.

Munitions, Etc.:

"The Present Status of Tin Fusible Plug Manufacture and Properties," by Dr. George K. Burgess, Bureau of Standards, Washington.

"Stellite," by Elwood Haynes, Haynes Stellite Works, Kokomo, Ind.

"Fire Prevention in Large Industrial Establishments," by C. W. Johnson, Westinghouse Electric & Mfg. Co., Pittsburgh.

"The Use of Die Casting in Munitions," by Charles Pack, Doehler Die Casting Co., Brooklyn.

"A Few Points on Alloy Patents," by William J. Rich, Patent Office, Washington.

"Shrapnel Bullets," by Harold J. Roast, the James Robertson Co., Ltd., Montreal.

"Recent Industrial Uses of Aluminum," by F. G. Shull, Aluminum Co. of America, Boston.

Testing Nonferrous Metals:

"Some Comparative Tests on Test Bars and Actual Castings," by W. M. Course, the Titanium Alloy Mfg. Co., Niagara Falls, N. Y., Buffalo.

"Analysis of Babbitts and Brasses," by E. W. Hagmaier, Buffalo.

"Standard Test Bars of 88-10-2 and 88-8-4, Being the Result of Co-operative Work of Six Foundries; a New Series of Tests," by C. P. Karr, Bureau of Standards, Washington.

"The Expansion Coefficients of Alpha and Beta Brass" and "The Corrosion of Manganese Bronze Under Stress," by Dr. Paul D. Merica, Bureau of Standards, Washington.

"Corrosion of Brasses of the Muntz Metal Type," by H. S. Rowdon, Bureau of Standards, Washington.

"Analysis of Cadmium in Brass," by Dr. F. Schramm, Bureau of Standards, Washington.

Metallurgy and Metallography:

"The Electrolytic Production of Antimony," by Prof. D. J. Demorest, the Ohio State University, Columbus.

"The Electrical Properties of Some High Resistance Alloys," by Prof. M. A. Hunter, Rensselaer Polytechnic Institute, Troy, N. Y., and F. M. Sebast.

"The Amorphous Theory in Metals," by Prof. Zay Jeffries, Case School of Applied Science, Cleveland.

"The Uses and Metallurgy of Antimony," by K. C. Li, Wah Chang Mining & Smelting Co., Inc., New York.

"Development and Reabsorption of the Beta Constituent in Alloys Which Are Normally of the Alpha Type," by Prof. C. H. Mathewson, department of mining and metallurgy, Yale University, New Haven, Conn., and Philip Davidson.

Iron and Steel Markets

BUYERS STILL WAITING

Weakness in Pig Iron, More in Scrap

France Buys Plates, but Italy's Orders Wait for Lack of a Price

Buyers of pig iron and of all forms of finished steel continue for the most part to hold aloof from the market, and their fear of what may happen to prices as the result of Government action is in sharp contrast with their willingness only lately to pay any price the producer might name.

It is evident that finished steel in the hands of manufacturers and jobbers is of fair proportions, and the latter in particular are disposed to work down their stocks in the interval of waiting.

Meanwhile the Government's cost inquiry goes on, with evidence that the problem of determining a representative cost of any form of finished steel is found to be more complicated than was counted on at the outset.

The summary ending of the shipbuilding controversy means an early and sharp increase in Government demand upon plate and structural mills and the Steel Corporation's formation of a shipbuilding subsidiary points in the same direction. The 3,000,000 tons of steel vessel capacity to be built in the coming year will take about 1,000,000 tons of plates, or about 50 per cent of what the ship plate mills can produce. In no other line will so large a part of the total output be taken by the Government, in spite of some loose statements from Washington as to the "Government requiring the entire maximum output of the mills for some time to come."

There is some comment on the slowness of specifications on Government steel which manufacturers were officially told several weeks ago must be put through at once, one such lot being 40,000 tons of rails for the Government's use abroad. No order for these has been received.

For Italy an inquiry for 10,000 tons of plates and a considerable tonnage of wire and other products has come through Washington, but no mill was found willing to take the business with the attached stipulation that the price would be fixed later by the United States Government. This is the first test of the attitude of the steel makers on the proposal that the Government and its Allies come in on the same basis.

On the other hand there has been buying for France through the old channels, the French Mission through J. P. Morgan & Co. having already placed 25,000 tons of plates, out of a total of 50,000 tons, for naval vessels and canal and river barges, deliveries to be made in September and October at the Washington Government's special request. For hull steel 6c. was paid and for boiler plates 9c.

Japan's requirements in ship steel are a matter of negotiations between the two Governments, but for the present the needs of this country and of

France and Russia are having precedence, with particular urgency for steel for the 500 Russian locomotives.

It is estimated that 1,000,000 tons of iron and steel products for export, including machinery, are now on the Atlantic and Pacific coasts or in transit to shipping ports. With such congestion and the delays in export licenses, there has been some re-selling of pig iron and of products rolled for export.

It is understood that the French Government has been willing to have deliveries on its shell steel held up and precedence given to rails and track supplies of which a large tonnage will go forward for the rehabilitation of its railroad system under the direction of an American expedition of 1000 men.

The expected taking up of a large part of the capacity of leading fabricating companies with ship work offsets the effect of high building costs on the structural trade. The present price of structural steel erected is around \$150 per ton, as against \$50 three years ago.

The production of enough tin plate to take care of the packing of perishable foods is now assured. Mills are still declining offers of export trade at attractive prices. Recent sales from stock have been at \$13 per base box.

Dullness and in some districts evidences of weakening have been the pig iron market's response to the discussion of Government regulation. It is recognized that for the present actual Government regulation of the general market has been averted, but the moral effect of low prices to the Government on large quantities of finished materials is a matter of wide concern in view of the extreme advances in pig iron. At Pittsburgh on some resales of Bessemer iron as low as \$53, Valley, was done, and basic iron is nominally \$52. In Northern Ohio some sellers have put a limit of \$55 on No. 2 foundry iron as against \$57 and \$58 recently asked. Southern iron resales have shown a range of \$45 to \$48, but business has been very much restricted.

Old material, always sensitive to changes in sentiment, has steadily declined since the markets for new steel halted. For a time covering of dealers' short sales regulated the downward movement, but in the past week such helps have been absent. In Northern Ohio heavy melting steel has fallen \$6 in the week, as low as \$30 being reported.

Pittsburgh

PITTSBURGH, July 24.

The opinion is very general in this district that the crest in prices has been reached, and on some lines, notably pig iron, semi-finished steel and several finished products, on which prices went unduly high, there may come a decided decline. It is recognized that prices on pig iron are too high, but this is probably true of any article that could be named in either iron or steel. There is almost an utter lack of new buying in pig iron and steel products, the entire trade holding off until it is known what the Government will do in the matter of fixing prices. As stated before, the trade here cannot figure out how the Government can fix prices on pig iron and steel products sold to domestic consumers and be fair to all concerned. In the case of

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 25, 1917.	July 18, 1917.	June 27, 1917.	July 26, 1916.
No. 2 X, Philadelphia....	\$53.00	\$54.50	\$50.75	\$19.75
No. 2, Valley furnace....	53.00	55.00	53.00	18.25
No. 2 Southern, Cin'tl....	49.90	49.90	47.90	16.90
No. 2, Birmingham, Ala.	47.00	47.00	45.00	14.00
No. 2, furnace, Chicago*	55.00	55.00	55.00	19.00
Basic, del'd, eastern Pa..	50.00	50.00	50.00	19.00
Basic, Valley furnace....	52.00	53.00	50.00	18.00
Bessemer, Pittsburgh....	55.95	57.95	55.95	21.95
Malleable Bess., Ch'go*	55.00	55.00	55.00	19.50
Gray forge, Pittsburgh...	46.95	47.95	47.95	18.70
L. S. charcoal, Chicago...	58.00	58.00	57.00	19.75

Rails, Billets, etc., Per Gross Ton:	July 25, 1917.	July 18, 1917.	June 27, 1917.	July 26, 1916.
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh.	100.00	100.00	100.00	42.00
O.-h. billets, Pittsburgh..	100.00	100.00	100.00	45.00
O.-h. sheet bars, P'gh...	105.00	105.00	105.00	45.00
Forging billets, base, P'gh	125.00	125.00	125.00	69.00
O.-h. billets, Phila....	110.00	110.00	110.00	45.00
Wire rods, Pittsburgh....	95.00	95.00	95.00	55.00

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia...	4.659	4.659	4.659	2.659
Iron bars, Pittsburgh....	4.75	4.75	4.75	2.50
Iron bars, Chicago.....	4.50	4.50	4.10	2.35
Steel bars, Pittsburgh...	4.50	4.50	4.50	2.50
Steel bars, New York...	4.669	4.669	4.669	2.669
Tank plates, Pittsburgh...	9.00	9.00	9.00	3.50
Tank plates, New York...	10.169	10.169	9.169	3.669
Beams, etc., Pittsburgh...	4.50	4.50	4.50	2.50
Beams, etc., New York...	4.669	4.669	4.669	2.669
Skelp, grooved steel, P'gh	4.00	4.00	4.00	2.35
Skelp, sheared steel, P'gh.	6.00	6.00	6.00	2.45
Steel hoops, Pittsburgh..	5.25	5.25	5.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	July 25, 1917.	July 18, 1917.	June 27, 1917.	July 26, 1916.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh	8.50	8.50	8.00	2.90
Sheets, galv., No. 28, P'gh	10.00	10.00	9.75	4.25
Wire nails, Pittsburgh...	4.00	4.00	4.00	2.50
Cut nails, Pittsburgh....	4.65	4.65	4.65	2.60
Fence wire, base, P'gh...	3.95	3.95	3.95	2.45
Barb wire, galv., P'gh...	4.85	4.85	4.85	3.35

Old Material, Per Gross Ton:

Iron rails, Chicago.....	\$41.50	\$44.00	\$49.00	\$18.50
Iron rails, Philadelphia..	45.00	45.00	52.00	20.00
Carwheels, Chicago.....	32.00	35.00	43.00	12.00
Carwheels, Philadelphia..	35.00	35.00	35.00	15.50
Heavy steel scrap, P'gh.	36.00	38.00	45.00	16.25
Heavy steel scrap, Phila	32.00	32.00	39.00	15.00
Heavy steel scrap, Ch'go	30.00	32.00	39.00	15.25
No. 1 cast, Pittsburgh...	32.00	32.00	38.00	15.00
No. 1 cast, Philadelphia..	35.00	35.00	39.00	16.00
No. 1 cast, Ch'go (net ton)	28.50	28.50	32.00	11.50
No. 1 RR. wrot, Phila....	48.00	48.00	57.00	19.50
No. 1 RR. wrot, Ch'go (net)	35.00	37.00	44.00	15.25

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	\$11.00	\$11.00	\$13.00	\$2.75
Furnace coke, future....	10.00	10.00	9.50	2.50
Foundry coke, prompt...	13.00	12.00	14.00	3.25
Foundry coke, future....	10.00	10.00	10.00	3.50

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York...	26.00	26.50	32.50	25.25
Electrolytic copper, N. Y.	26.00	26.50	32.50	25.00
Spelter, St. Louis.....	8.50	8.62 1/2	9.12 1/2	10.25
Spelter, New York.....	8.75	8.87 1/2	9.37 1/2	10.50
Lead, St. Louis.....	10.25	10.37 1/2	11.50	6.00
Lead, New York.....	10.25	10.50	11.70	6.20
Tin, New York.....	62.50	62.50	62.00	38.00
Antimony (Asiatic), N. Y.	15.00	16.00	19.00	13.50
Tin plate, 100-lb. box, P'gh.	\$12.00	\$12.00	\$12.00	\$6.00

merchant blast furnaces that buy their ore, coke and limestone, the Government might fix a price on pig iron that would be below cost of such furnaces, while on the other hand, steel works furnaces that own and mine all their own raw materials might have a cost that would be considerably below the price fixed by the Government. Bessemer pig iron has declined at least \$2 per ton, some resale Bessemer iron having touched \$53, Pittsburgh, but it is not believed any more could be had at this price. It is certain the market on Bessemer to-day is not above \$55, but there is not enough doing to establish a price. Basic and foundry are holding fairly steady in the absence of sales. Southern No. 2 foundry has sold in competition with Valley furnace at \$51.55 delivered. New demand for finished steel products has almost stopped, consumers not taking a pound of anything they can avoid. Prices on coke are again lower, best grades selling to-day at \$10 at furnace, while all grades of scrap have again declined from \$1 to \$2 per ton.

Pig Iron.—The local pig-iron market is extremely dull and prices on all grades are weak. There have been resales of Bessemer iron at as low as \$53 and \$54, but most of it has brought \$55, Valley furnace. There is no new demand for either Bessemer or basic, but prices on basic are ruling fairly steady. Foundry iron is also weaker, and is being offered from \$53 up to \$55 at Valley furnace. Furnaces are still strong in their ideas as to prices, but it is very doubtful whether they could sell Bessemer iron to-day at \$55, although some sellers are still quoting \$57. In the absence of sales, basic iron is nominally \$52, and No. 2 foundry \$53 to \$55. The pig-iron market will no doubt remain very dull, with prices weak, until something definite comes from the Government as to its position in fixing prices. We note sales of Bessemer in the past week of 5000 to 6000 tons at \$54 to \$55 at furnace.

We quote Bessemer iron at \$55; basic, \$52; malleable Bessemer, \$53; No. 2 foundry, \$53 to \$55, and gray forge,

\$46 to \$47, all f.o.b. at Valley furnace for delivery this year. The freight rate from Valley furnaces on pig iron to the Cleveland and Pittsburgh districts is 95c. per ton.

Billets and Sheet Bars.—The local steel market is extremely dull and we do not hear of any sales of billets or sheet bars in the last week. Consumers are getting fairly good deliveries on contracts, but no consumer will buy steel unless forced to do so, under present conditions. It should be remembered that while soft Bessemer and open-hearth billets are quoted at \$95 to \$100 and soft Bessemer and open-hearth sheet bars at \$105, probably 50 per cent of shipments of sheet bars to tin-plate mills are going in at \$50 or less. It would simply be impossible for tin-plate mills to pay anything like \$100 for bars and sell their tin plate at \$7.50 per box, which was the price fixed some months ago for delivery over last half of this year. The greater part of the output of the tin-plate mills is being shipped on the contracts taken at this price. In conditions like those ruling at present, quoted prices on semi-finished steel are largely nominal.

We now quote soft Bessemer and open-hearth billets at \$95 to \$100 and soft Bessemer and open-hearth sheet bars at \$105 to \$110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at \$125 to \$135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Steel Rails.—The new demand for light rails is reported active, and the mills rolling new light rails from billets and also the rerolling rail mills are pretty well sold up over the remainder of this year. Any mills that can furnish either new or rerolled light rails can get premiums of \$5 to \$10 per ton over what are regarded as regular prices. No orders are being placed for standard sections. Prices on new light rails and standard sections are given on page 219.

Ferromanganese.—The new demand is very dull, indicating that consumers are well covered ahead on ferromanganese and are getting prompt deliveries. For delivery over last half of this year, we quote 80 per cent ferromanganese at \$350 to \$375 and for first half of

next year \$250 to \$325, f.o.b. cars, maker's furnaces. We quote 18 to 20 per cent spiegeleisen at \$80 to \$85 per gross ton at furnace. New demand for Bessemer ferrosilicon and silvery iron is quiet, consumers being well covered over the remainder of this year. We note a sale of 1000 tons of 10 per cent Bessemer ferrosilicon at the reported price of \$95 at maker's furnace for delivery over the remainder of this year.

We quote 9 per cent Bessemer ferrosilicon at \$89, 10 per cent \$90, 11 per cent, \$95, 12 per cent \$100, 13 per cent \$105, 14 per cent \$115, 15 per cent \$125, and 16 per cent \$135. We now quote 7 per cent silvery iron at \$84 to \$89, 8 per cent \$85 to \$90, 9 per cent \$86 to \$91, 10 per cent \$87 to \$92, 11 and 12 per cent \$88 to \$93. All f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of \$2 per gross ton for delivery in the Pittsburgh district.

Plates.—New inquiry on plates has quieted down. Consumers who can are holding off until it is known what prices on plates the Government is going to fix on its purchases. At the same time, mills that can make fairly prompt deliveries can get 10c. or more for $\frac{1}{4}$ -in. and heavier sheared plates at mill. A few steel car orders came out in the past week. The H. C. Frick Coke Co., which recently placed an order with the Ralston Steel Car Co. of Columbus, Ohio, for 1500 70-ton steel gondola cars, needs these cars for quicker movement of coke to the blast furnaces of the Carnegie Steel Co. The Standard Steel Car Co. will build 250 steel gondolas for the Phelps-Dodge Co. The Republic Iron & Steel Co. is in the market for 50 coke and 50 steel gondolas. It is believed that within a very short time the Government will announce the prices it will pay for plates, and as soon as this is done there may be a readjustment to a lower basis in prices on plates charged by the mills to domestic consumers. We quote $\frac{1}{4}$ -in. and heavier sheared plates for delivery over the remainder of this year at 9c. to 10c. at mill, but small lots from warehouses bring 12c. to 13c. and higher.

Structural Material.—Very little new business is being placed and inquiry is light. Local fabricators say they are well filled up over the remainder of this year and are not very anxious to take on much new business from the domestic trade, as they feel sure the Government will be calling on them before long for considerable tonnage. The McClintic-Marshall Co. has taken about 2200 tons of Government work at Saint Julian Court, Fla., and a magazine and shell building at Hingham, Mass. The American Bridge Co. is taking a good deal of Government work, mostly in the East. Prices on structural steel are given on page 219.

Sheets.—Fairly heavy direct orders for sheets are being placed by the Government, and also indirect orders by manufacturers for making goods of various kinds for Government use in cantonments and other purposes. One inquiry is referred to as being in the market for 16,000 tons of sheets for camp stoves, but this quantity is thought to be too large. So far, the sheet mills have furnished to the Government all the sheets it asked for within the time specified and in a few cases even more promptly. Should the Government fix prices on steel it intends to buy, it is not believed the prices will be much, if any, below what the Government has been paying for sheets for some time, these prices, as noted last week, being 6.25c. for blue annealed; 6.50c. for Bessemer black, and 8.50c. for galvanized, all No. 28 gage. Sheet mills report deliveries of steel are better, while the output of sheets is larger and would be still heavier, were it not for the shortage of labor, which is getting more serious. Sheet mill labor is now being paid the highest wage ever known in the history of the sheet business, rollers making \$20 per day, and more. The output of sheets of all grades is pretty well sold up for the remainder of this year. Mill prices for carloads and larger lots to the domestic trade are given on page 219.

Tin Plate.—The export demand is heavy. Italy has one inquiry out for 15,000 boxes, and another for 10,000. One tin plate mill was recently offered 14,000 boxes for export business, that would have netted close to \$17.50 per base box, at mill, but had to turn it down. Meat packers this year will take possibly double the quantity of tin plate used last year. One leading

packer, who three years ago used 150,000 boxes of tin plate, expects to use this year about 425,000 boxes. The American Sheet & Tin Plate Co. is now operating six of its 10 double hot tin mills in its Shenango works at New Castle, Pa., and expects to have all the mills operating in August. It is also operating some of the double hot tin mills being added to its Farrell works at Farrell, Pa. The output of enough bright plate this year for packing perishable foods is assured, and packers of non-perishable foods are now receiving almost their requirements. The new demand for tin plate will no doubt be heavy during the war and it is expected that after the war a good part of the tin plate needed by England, France, Italy and Japan will come from the United States, as those countries will not be able for some years to make enough to supply their needs. For this reason it is figured that the American tin plate trade for some years to come will be very heavy in England. One mill sold 1500 boxes recently for shipment from stock at \$13 per base box. We quote primes from stock at \$11 to \$13 per base box, depending on size and quantity wanted.

Iron and Steel Bars.—The new demand is dull, most consumers being covered by contracts, and any users that have to buy will purchase only what they absolutely need on account of the uncertainty as to what action the Government will take concerning prices. Specifications against contracts are reported active, and the output of iron and steel bars for this year is pretty well sold up. The new demand for reinforcing bars is heavier than for some months. It is believed that prices on iron and steel bars have about reached the high point. These are given in carloads and larger lots to regular domestic customers on page 219.

Hoops and Bands.—There is very little new buying, and what is being done is only in small lots. Prices on steel hoops range from $5\frac{1}{2}$ to 6 cents to regular customers, but sales have been made as high as 7 cents. Steel bands range from 5c. to 6c., but sales of small lots for fairly prompt shipment have been made at as high as $6\frac{1}{2}$ c. to 7c.

Muck Bar.—There is no inquiry in this market, but high-grade muck bar, made from all pig iron, would bring very close to \$100 per gross ton, at mill.

Wire Rods.—The export demand is still very heavy, and orders for rods for export to Japan and South America, and also to Canada, have been booked recently by several local mills. There have been recent domestic sales of soft, Bessemer and open-hearth rods at \$95 to \$100, and also high carbon rods at prices ranging from \$110 to \$120, maker's mill. Prices on rods are given in detail on page 219.

Wire Products.—So far as known, none of the independent makers of wire and wire nails has indicated that he will reduce prices in order to protect jobbers against the lower prices on wire and wire nails being quoted by the leading interest, which are \$3.25 for nails, and \$3.25 for bright basic wire, or \$16 per ton under what the independent mills are quoting. It is said that some jobbers who get a part of their requirements of wire and wire nails from the leading interest have agreed to sell the same percentage to their trade at prices suggested by the leading interest, which are \$3.70 for nails and \$3.75 for bright basic wire. In other words, if a jobber is getting 25 per cent of his needs from the leading interest, he will sell that percentage at the price named above. Orders for wire nails are being placed at \$4 and for bright basic wire at \$4.05, but the new demand is dull. The American Steel & Wire Co. has entered orders from its regular trade for wire nails at \$3.20 per keg and bright basic wire at \$3.25 per 100 pounds, but will make no promise of definite delivery. Prices quoted on wire and wire nails by independent mills, some of which can ship out fairly promptly, are given on page 219.

Shafting.—The new demand is quiet. This being true also of nearly all lines of finished steel, but consumers of shafting are well covered for the year, and specifications are fairly heavy. On the smaller sizes, some makers can ship out in eight to 10 weeks from date of order, but on the larger sizes not for three to four months. Discounts on shafting remaining at

10 to 5 per cent off, depending on quantity, and whether the buyer is a regular customer.

Railroad Spikes and Track Bolts.—An inquiry is in the market from the Ann Arbor Railroad Co. for 1500 kegs of spikes for delivery over the first half of next year. The new demand is dull and railroads are not specifying freely against contracts for spikes placed some time ago. It is believed that prices on both spikes and track bolts have probably reached the limit. These are given on page 219.

Cold Rolled Strip Steel.—A meeting of cold rolled strip steel manufacturers was held in Atlantic City last week, in which trade conditions were discussed. It developed that the new demand was only fairly heavy, most consumers being covered over the remainder of the year. The policy is still in force on insisting that specifications for 50 per cent must accompany new orders and the other 50 per cent be received within 60 days. The Phillips Sheet & Tin Plate Co., Weirton, West Virginia, is doubling its capacity in the manufacture of cold rolled strip steel and before long will be able to turn out about 6000 tons per month.

On contracts, mills are quoting 9c. at mill, but on small current orders, prices range from 10c. up to 12c. at mill. Terms are 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Nuts and Bolts.—As is the case on all other lines of finished steel, the new demand for nuts and bolts has fallen off, but makers have enough business on their books to carry them pretty well over the remainder of this year. It is believed prices on nuts and bolts have reached the top, and the new demand for some time is likely to be small, and only for actual needs. Shipments are fairly heavy, but the shortage in labor and steel is keeping down output to some extent. Discounts adopted on April 12 last, which give prices to the large trade in car loads, over which advances are charged for small lots, are given on page 219.

Rivets.—The new demand has fallen off a good deal, but makers have their output pretty well sold up for remainder of this year. Specifications against contracts are heavy, and it is said some fairly large orders have lately been placed by the Government.

Prices on structural rivets for delivery up to Oct. 1 only are \$5.25 per 100 lb., base, and on cone head boiler rivets \$5.35 base, per 100 lb., f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent off for cash in 10 days.

Wrought Pipe.—It developed that the recent order for 6-in. steel placed by the Tubular Committee for the Government was for 640,000 ft. instead of 400,000 ft. and the committee has also placed 138,000 ft. of 4-in. steel pipe, all to be used for building water lines for cantonments and National Guard encampments. Several of the larger mills are not quoting on new business, except to regular customers, and for such deliveries as they can make. Requirements of the Government in pipe are expected to be very heavy and the mills are conserving as much of their future output as they can to meet this demand. On lapweld pipe, mills are well sold up for this year, but on butt weld pipe can make deliveries in 10 to 12 weeks. Discounts on steel pipe, as adopted May 1, and on iron pipe, as adopted July 1, are given on page 219.

Boiler Tubes.—It is said the Government is taking at present at least 30 per cent or more of the output of iron and steel tubes, and that it will take a larger percentage when work has been started on projects now under way. For many months, the National Tube Co. and other makers of tubes have been furnishing millions of feet to the Government, and the quantities to be furnished in the future are certain to be larger. Nominal discounts on iron and steel tubes as adopted Nov. 1, 1916, but which give prices very much below what are actually ruling, are given on page 219.

Old Material.—Reports received here indicate that prices on scrap at other important consuming centers are relatively lower than in the Pittsburgh district. It is true prices here have declined from the high values of three or four weeks ago, but not to the extent they

have at other places. Dealers here will not sell short, even at the lower prices now ruling, nor will they go long on scrap at present prices, feeling that the Government may possibly take hold and regulate prices. However, scrap is in a class by itself, and it is not believed it is feasible for the Government to regulate prices, as it proposes to do on pig iron and some forms of steel. It often happens that one important scrap center is active and prices ruling firm, while at other places the market may be dull, and prices weak from purely local causes. Whatever may be done by the Government in the direction of regulating prices on scrap, the fact remains that the local market is dull, there being very little new buying, but prices in the past week have held fairly steady, having gone off only \$1 to \$2 per ton. About the middle of last week there were sales of 1250 tons of heavy steel scrap at \$38 per gross ton, delivered to consumers' mills, 500 tons of low phosphorus scrap at about \$48, and 1000 tons or more of hydraulic compressed sheet scrap at \$32 per gross ton, delivered. It is doubtful, however, whether as high as the above prices could be obtained to-day. Large consumers are not buying, and the accumulation of scrap in the hands of small dealers who desire to get rid of it is getting larger, and this may further depress prices. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$36.00 to \$38.00
No. 1 foundry cast	32.00 to 33.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	43.00 to 44.00
Hydraulic compressed sheet scrap	30.00 to 31.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	22.00 to 23.00
No. 1 railroad malleable stock	30.00 to 31.00
Railroad grate bars	19.00 to 20.00
Low phosphorus melting stock	48.00 to 50.00
Iron car axles	50.00 to 52.00
Steel car axles	50.00 to 52.00
Locomotive axles, steel	60.00 to 62.00
No. 1 busheling scrap	28.00 to 29.00
Machine-shop turnings	22.00 to 23.00
Cast iron wheels	34.00 to 35.00
Roller steel wheels	44.00 to 45.00
*Sheet bar crop ends	44.00 to 45.00
Cast iron borings	22.00 to 23.00
No. 1 railroad wrought scrap	40.00 to 41.00
Heavy steel axle turnings	27.00 to 28.00
Heavy breakable cast scrap	27.00 to 28.00

*Shipping point.

Coke.—The placement of cars in the coke regions last week was about 90 per cent, but the loading and shipping were only about 70 per cent of cars furnished. Due to a full car supply, and also because of the fact that operations at some blast furnaces are slowing down on account of the hot weather, the demand for prompt furnace coke has fallen off to some extent, but is still fairly active. Labor conditions in the coke regions are bad, there having been strikes the last week in the Westmoreland and Irwin fields, the miners and coke workers demanding that their unions be recognized, but this was refused by the operators. In the hot weather, coke workers, especially drawers, whose work is very hot, usually lay off and try to find cooler work. This has cut down the labor supply, and in addition coke workers are making so much money at present that most of them want to work only about four days per week. Usually for a day or two after pay-day, more than half the coke workers fail to report for duty. Prices on high grade prompt blast furnace coke have further declined, and on Monday and Tuesday of this week there were sales of 100 to 125 cars of best grade blast furnace coke for prompt shipment at \$10 per net ton at oven. Prompt 72-hour foundry coke of best grades is selling at about \$13 per net ton at oven for prompt shipment. Nothing is being done in either furnace or foundry coke on contracts, as coke producers still feel that the Government may step in and regulate prices of coke, and also of coal. We quote best grades of prompt furnace coke at \$11 and 72-hour foundry at \$13 per net ton at oven. The Connellsville Courier gives the output of coke in the upper and lower Connellsville regions for the week ending July 14 as 345,519 tons, an increase over the previous week of 301 tons.

Chicago

CHICAGO, July 23.

The lull in buying is pronounced, and its effect has been felt by the banks. They expect the tide to turn with a rush with the harvesting of the crops. The iron and steel trade, nevertheless, is showing a decided feeling of optimism which was not in evidence a couple of weeks ago. The change in mental attitude undoubtedly is due to more numerous Government orders in this territory, a belief that amicable understanding and not statute will determine the prices which private consumers will pay, and the knowledge that the requirement of export licenses has not interfered to any great extent with foreign business. The Government order for thousands of automobile trucks has already resulted in business running into hundreds of thousands of dollars for manufacturers of steel castings. Local mills have received orders for ship plates for the Mare Island and Puget Sound Navy Yards, the latter yard also requiring concrete reinforcing bars, but only a few hundred tons. The Rock Island Arsenal enlargements are taking bars, rails and other materials. It is understood that considerable Government business is being placed, with the understanding that the prices governing transactions will be fixed later. Pig iron, though quiet, shows no declines. Southern makers of iron are having their troubles over the short supply of coke, of labor and of cars. Nearly every item in the old-material list shows a decline. Several important mills are steering clear of the scrap market, and dealers show no disposition to take on heavy commitments at this time. Just why scrap prices should make such a radical descent is not altogether clear in view of prices obtained for finished iron and steel products.

Plates.—An order for something over 2300 tons of ship plates is to be placed with a local mill by the Government for delivery at Mare Island, Cal., and the Puget Sound Navy Yard. The Goethals-Denman controversy is held responsible for delaying many similar orders. Thousands of tons of plates are waiting license to ship, particularly to Japan. Quotations on plates for export range from 10.75c. to 11c., mill. An order for several hundred gross tons was taken this week with the proviso that shipment would be made within 60 days after the lifting of the embargo, or the granting of a license. For delivery this year, ordinary tank plates are quoted at 10.189c., Chicago, but business is much restricted.

We quote for Chicago delivery of plates out of jobbers' stocks, 8c.

Structural Material.—The leading interest reports no structural lettings whatever this week, and much the same condition seems to prevail in all directions. On limited lots, an Eastern mill quotes 6.189c., Chicago. The 100 cars wanted by the Santa Fe are what are termed concentrate (not composite) cars and are presumably for mine use. They will be built by the Pullman Co. Two or three interests are asking for prices on 1200 cars for the Russian Government, the inquiry apparently being a fresh one, but not much is known about it. The C. & O. inquiry for 1000 hoppers is still pending.

Jobbers quote 5c. for material out of warehouse.

Pig Iron.—Business has been almost at a standstill since the last report, but there is no firm suggestion of lower prices and the market is not likely to decline unless holders of speculative iron become over-eager to sell. Some little talk of resale iron has been heard, but it is more or less intangible. The strength of first hands is maintained by the sold-up state of the furnaces. Northern basic, malleable Bessemer and No. 2 foundry is held at \$55, furnace, any delivery, while the leading seller of Southern iron quotes \$50, Birmingham, or \$54, Chicago, for last quarter, and \$48, Birmingham, for next year, for standard No. 2 iron. An occasional lot not conforming to standard, might be found at \$48 to \$50, Birmingham, for this year, and \$45, for the first half. The shortage of coke is causing distress in the South, while freight cars are hard to find. Many furnaces in both Alabama and Tennessee have been obliged to bank for a few days because of insufficient fuel.

Some of those which operate their own coke ovens have not been much better off than those which buy their coke, inasmuch as the oven owners cannot get enough labor and have been compelled to enter the market for coke. After a furnace has been put in blast after being down for a week, it is invariably another week before it is regularly producing standard iron, in consequence of which the monetary loss is greatly increased. Furnaces are piling iron because they cannot get enough cars to ship. In one case where it was sought to procure some "empties," it was learned that the cars in question were to be sent "light" to a lumber camp to be loaded with timber required at one of the cantonments. It is reported that standard low phosphorus business has been done recently at \$89, delivered at Chicago, but quotations run up to \$95, Chicago. No change in respect to prices has occurred in charcoal iron. One leading maker is reserving about 25,000 tons for its regular customers who have not yet covered, and who will need iron between this time and July 1, 1918. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 4.	\$58.00 to \$62.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	58.00 to 62.00
Northern coke foundry, No. 1	55.50
Northern coke foundry, No. 2	55.00
Northern coke foundry, No. 3	54.50
Northern high-phosphorus foundry	55.00
Southern coke No. 1 f'dry and 1 soft	55.00
Southern coke No. 2 f'dry and 2 soft	54.00
Malleable Bessemer	55.00
Basic	55.00
Low-phosphorus	93.00 to 95.00
Silvery, 8 per cent.	82.75

Ferroalloys.—The minimum for 80 per cent ferro-manganese is unchanged at \$400, delivery late this year or in 1918, but prompt material probably could be had around \$425, against \$450 a few days ago.

Bars.—The Government has ordered 637 tons of concrete reinforcing bars for a dock at the Puget Sound Navy Yard, and through Stone & Webster, engineers and contractors, is inquiring for about 2800 tons of plain round rods for the Rock Island Arsenal, presumably for concrete work. Mild steel bars are unchanged at 4.589c., Chicago, with but little activity. Rail carbon bars range from 4c. to 4.50c., Chicago, there having been some sharp competition among the makers. Bar iron is steady, and quoted at 4.50c. to 5c., Chicago. Jobbers have not changed their quotations.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c. to 5c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—The leading interest has announced no change in its price policy. It continues to quote on the basis of 3.20c. for wire nails, and has made known to its jobbing customers its belief that 3.95c. is a fair basis on which to sell to retailers. Officers of the leading company confirm their intention of discontinuing direct mill shipments of less than carload lots to jobbers' customers, thereby compelling the jobbers themselves to distribute the smaller lots. The plan was designed to economize in the use of cars, but despite this result it has aroused much protest in some directions and possibly led to the conclusion that it is impossible to please everybody. Independent wire mills continue to quote on the basis of 4c., Pittsburgh, for nails, their quotations to jobbers, per 100 lb., being as follows:

Plain fence wire, Nos. 6 to 9, base, \$4.189; wire nails, \$4.189; painted barb wire, \$4.339; galvanized barb wire, \$5.039; polished staples, \$4.339; galvanized staples, \$5.039; all Chicago, carload lots.

Rails and Track Supplies.—Stone & Webster, the contractors having in charge the erection of a large plant at the Rock Island Arsenal, are inquiring for about 600 tons of 80-lb. standard section rails. Carloads, and lots of rails up to 600 tons, have sold at fancy prices of late. For 500 tons \$60 has been paid for rails accumulated by a mill which is not taking on new business. Another mill has sold carloads at \$80, and it is reported that in the East small lots have

brought \$100. Spikes are in tremendous demand for shipbuilding.

Quotations are as follows: Standard railroad spikes, 4.25c. base; small spikes, 4.50c., base; track bolts with square nuts, 5.25c., all in carloads, Chicago; tie plates, \$70 to \$90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, \$38, base; open hearth, \$40; light rails, 25 to 45 lb., \$65; 16 to 20 lb., \$66; 12 lb., \$67; 8 lb., \$68; angle bars, 3.25c., base.

Bolts and Nuts.—Manufacturers are agreeably surprised by the fact that their foreign business has not been interfered with to any serious degree by the requirement of export licenses. Business is good and their chief trouble is scarcity of labor and material. Their reports show that activity is the greatest in the East. For prices and freight rates see finished iron and steel, f.o.b., Pittsburgh, page 219.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to $\frac{3}{8}$ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to $\frac{3}{8}$ x 6 in., 40-2 $\frac{1}{2}$; larger sizes, 30-5; hot pressed nuts, square, \$3, and hexagon \$3 off per 100 lb.; lag screws, 50 per cent off.

Sheets.—The situation is without change, galvanized sheets being particularly difficult to find. No. 10 blue annealed can be had in limited quantities at 8.50c. to 9c., Pittsburgh, or 8.689c., Chicago, and No. 28 black at 8.75c. to 9c., Pittsburgh, or 8.939c. to 9.189c., Chicago. Jobbers' quotations are unchanged.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.50c.; and No. 28 galvanized, 11c.

Cast-iron Pipe.—Duluth, Minn., cut its purchase of cast-iron pipe down to 500 tons (instead of 900 tons) and placed the order with the United States Cast Iron Pipe & Foundry Co. Aside from some small municipal propositions involving, in the aggregate, only about 100 tons, no new business is pending. Quotations are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., \$68.50; 6 in. and larger, \$65.50, with \$1 extra for class A water pipe and gas pipe.

Old Material.—The market continues quiet, and prices are still on the down-grade. Dealers have been devoting themselves principally to filling orders for odds and ends, and are not anxious to take on large commitments under present conditions. It goes without saying that consumers' needs are sufficiently covered for the present, and that when they do show renewed interest, prices will work up again. The plants of an important consumer at East Chicago and Grand Crossing are under a partial railroad embargo. The railroad lists are inconsequential, small lists being offered by the Soo Lines and the Monon Route. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	\$41.50 to \$42.50
Relaying rails	59.50 to 60.00
Old carwheels	32.00 to 33.00
Old steel rails, rerolling	42.00 to 43.00
Old steel rails, less than 3 ft.	41.00 to 43.00
Heavy melting steel scrap	30.00 to 32.00
Frogs, switches and guards, cut apart	30.00 to 32.00
Shoveling steel	29.00 to 30.00
Steel axle turnings	22.50 to 23.50

Per Net Ton

Iron angles and splice bars	\$41.00 to \$42.00
Iron arch bars and transoms	43.00 to 44.00
Steel angle bars	36.00 to 37.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
No. 1 railroad wrought	35.00 to 36.00
No. 2 railroad wrought	31.00 to 32.00
Cut forge	31.00 to 32.00
Pipes and flues	24.00 to 25.00
No. 1 busheling	25.50 to 26.50
No. 2 busheling	19.00 to 20.00
Steel knuckles and couplers	41.00 to 42.00
Steel springs	42.50 to 43.00
No. 1 boilers, cut to sheets and rings	22.50 to 23.00
Boiler punchings	34.50 to 35.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	17.00 to 18.00
Cast borings	17.50 to 18.00
No. 1 cast scrap	28.50 to 29.50
Stove plate and light cast scrap	18.50 to 19.50
Grate bars	21.00 to 22.00
Brake shoes	21.00 to 22.00
Railroad malleable	29.00 to 30.00
Agricultural malleable	25.75 to 26.75
Country mixed scrap	15.50 to 16.50

Philadelphia

PHILADELPHIA, July 23.

New business, save on Government specification and on ship materials, is light in this market, as buyers are apparently holding off to see whether the Government's price-fixing ideas harden into a concrete policy. So far as the steel mills are concerned, this lull is not unwelcome, for they are sold so far ahead that the lack of new business at this time is having no effect on prices. In other lines the slowing down has had its effect in reducing quotations, this being true in some lines of old materials and in foundry irons, though the latter are being subjected to influences generated by the appearance of re-sale tonnages. Government orders are being received in increasing volume by mills in this district, and not only are new specifications coming in but rearrangements are being ordered in the sequence of deliveries on contracts already on the books. Under the new export arrangements, shipments of finished materials are going to Canada with hardly a break, while materials destined for Great Britain, France and Italy are apparently having no trouble in obtaining a clear path so far as the embargo is concerned. It is confidently expected here that when the shipping snarl in Washington is disentangled work will begin on the erection of a Government-promoted shipbuilding plant here in the vicinity of League Island on one of the few first-class deep-water fronts still available on the west bank of the Delaware between Philadelphia and Wilmington.

Pig Iron.—Things are dull in the whole list of standard irons. Re-sale iron is affecting the market to some degree, and so is the influence of a few sellers who are not fully sold ahead. There is a good deal of inquiry for export, chiefly to Japan, and Southern iron seems to be wanted for this purpose, though other export inquiries include basic and Bessemer in lots of 3000 to 5000 tons. It is reported that a fair tonnage of Southern iron originally intended for Scotland has been diverted to meet a Japanese inquiry, but no license to ship has been received. Part of the iron offered for re-sale is on the account of exporters who failed to obtain all the shipping room they required, and part is said to be offered on account of small foundries who prefer to take profits on their raw material rather than work it up into castings. Under the circumstances eastern Pennsylvania No. 2 X is quoted to-day at \$55, delivered, as the market top, though makers who have no iron to sell maintain the figure of \$55, furnace. Virginia irons remain about where they have been, with \$52.50, furnace, about the top of the market, though there are reports of small sales at \$54, furnace, for delivery within the calendar year and \$57 for prompt. One large Virginia interest has put out a list of special irons, high manganese and high silicon, in which prices ranging from \$58.50 to \$66, furnace, are asked for the small tonnages available in each analysis. Some small tonnages of Alabama No. 2 have been sold here at \$45 to \$48, Birmingham, for first half, but an inquiry of 1000 tons for export was declined by the house which received it. Steel-making irons share the general quietness, basic holding to a nominal quotation of \$50 to \$52, with low phosphorus maintaining its price of \$90. Quotations for standard brands, prompt shipment, and delivery in buyers' yards, are about as follows:

Eastern Penna. No. 2 X foundry	\$53.00 to \$55.00
Eastern Penna. No. 2 plain	52.50 to 54.50
Virginia No. 2 X foundry	54.25 to 55.25
Virginia No. 2 plain	53.75 to 54.75
Basic	50.00 to 52.00
Standard low phosphorus	90.00

Ferroalloys.—Conditions are somewhat easier in alloys, and a considerable amount of re-sale ferromanganese has made its appearance. Sales of ferromanganese for third quarter are reported at prices ranging from \$410 to \$430. There is still a good volume of inquiry for 50 per cent ferrosilicon.

Coke.—Spot furnace coke was sold to-day at \$11, a substantial decrease from the prices asked a week ago. Foundry coke was quoted as high as \$13.50, but this

spread was considered rather too great on the basis of actual furnace coke sales.

Plates.—Tonnes ordered during the week have been heavy, but the great bulk of the work came directly or indirectly from the Government, which is virtually monopolizing the output of the plate mills. Prices are still maintained at 10c., Pittsburgh, for tank and 12½c., base, mill, for ship steel, but these are the minimum and some civilian business was taken on this week on a basis of 11c., base, Pittsburgh, for tank. Such instances are rather rare, for one maker turned down an order for 1000 tons of tank steel at 11c., base, mill, on the ground that the buyer was not a regular customer. Mills are making a record output, but will make no promises on material for domestic use. It is made clear that all such business is taken at mill convenience, with ten or twelve months likely to elapse before delivery, and that Government orders are to have the preference even if this term is lengthened. It is understood that among the Government specifications in this district during the week was one for about 4000 tons of plates from ¼ in. to ½ in.

Iron and Steel Bars.—An inquiry for about 1400 tons of steel bars for use in the new shipyard at Cornwells, above Philadelphia, on the Delaware River, was made here this week. Prices on soft steel bars remain firm on the basis of 4½c., base, Pittsburgh, with 5c., base, Pittsburgh, asked on bar iron, and little business being taken. Makers of bar iron hesitate at new contracts for the remainder of the year. One large maker of steel bars received an inquiry this week on 150 tons of standard spikes for export but declined to make a quotation.

Sheets.—Government orders have taken up all the sheet capacity in this district and only very exceptional circumstances could make it possible to get a civilian order on the books. The nominal price, based on the last reported transaction, is 8¾c., Pittsburgh, for No. 10 blue annealed.

Old Material.—Business has been slow and prices are off, but dealers profess to think that the bottom has been reached, or at least nearly reached. Mills are out of the market, but it is generally thought that they will be obliged to buy soon, whether a price-fixing program is adopted or not. Some idea of how prices have shaded off since the big rise of a few weeks ago can be seen in the quotations on turnings for blast furnace use. From a quotation of about \$23 in June they fell off to a price of \$20 to \$21 during the first two weeks of July and to-day are held at \$19 to \$20. Odd sales in different numbers on the old materials list afford prices better than the market, as in the case of No. 1 heavy melting steel, in which some small transactions were reported to-day at \$35. Prices per gross ton, delivered in eastern Pennsylvania territory, are about as follows:

No. 1 heavy melting steel.....	\$32.00 to \$33.00
Old steel rails, rerolling.....	45.00 to 47.00
Low phosphorus heavy melting.....	45.00 to 50.00
Old iron rails.....	45.00 to 47.50
Old carwheels.....	35.00 to 38.00
No. 1 railroad wrought.....	48.00 to 50.00
No. 1 forge fire.....	24.00 to 25.00
Bundled sheets.....	24.00 to 25.00
No. 2 busheling.....	16.00 to 17.00
Machine shop turnings (for blast furnace use).....	19.00 to 20.00
Machine shop turnings (for rolling mill use).....	21.00 to 23.00
Cast borings (for blast furnace use).....	19.00 to 20.00
Cast borings (clean).....	23.00 to 25.00
No. 1 cast.....	35.00 to 38.00
Grate bars.....	21.00 to 22.00
Stove plate.....	22.00 to 23.00
Railroad malleable.....	32.50 to 35.00
Wrought iron and soft steel pipe (new specifications).....	34.00 to 35.00

Cleveland

CLEVELAND, July 24.

Iron Ore.—The car situation at lower Lake ports, which has been very serious and has caused the holding up of cargoes from three to five days at docks, shows some improvement, but shippers are considerably behind on their schedules owing to the delays. A few small lot sales of ore are reported. Rail rates on ore from the Gogebic and the Menominee ranges to upper Lake ports were advanced 6c. a ton this month, and

an advance of 8½c. will be made July 27 on the rail rate on ore from the Mesaba range. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, \$5.95; Mesaba Bessemer, \$5.70; old range non-Bessemer, \$5.20; Mesaba non-Bessemer, \$5.05.

Pig Iron.—Leading producers have taken a stand against further advances in pig-iron prices, and have decided on \$55 as the maximum price they will quote on basic, foundry and malleable iron. This means a reduction in prices by some interests that have been making sales at \$57 and \$58 and in one case at \$60. The aggregate tonnage sold above \$55 has not been large, being mostly small lots for this year's delivery. Most of the resale iron that was a disturbing factor in the market last week appears to have been disposed of. In view of the present unsettled condition regarding price regulation the market is extremely dull. Very few sales are reported, these being for small lots for early shipment and no new inquiries of any size have come out. The Southern iron market is inactive, with prices ranging from \$45 to \$50, Birmingham, for this year's delivery, and \$48 to \$50 for the first half of next year. Foundries are endeavoring to stock up on Southern iron as much as possible in order to avoid the danger of a shortage later, should shipments be delayed. Bessemer ferrosilicon has sold at \$100 for 10 per cent for a small lot. Small lot sales of low phosphorus iron are reported at \$85 to \$87. We quote, f.o.b. Cleveland, as follows:

Bessemer.....	\$55.95 to \$56.95
Basic.....	52.30 to 54.30
Northern No. 2 foundry.....	53.30 to 55.30
Southern No. 2 foundry.....	49.00 to 54.00
Gray forge.....	50.95 to 52.95
Ohio silvery, 8 per cent silicon.....	88.62 to 91.62
Standard low phos. Valley furnace.....	85.00

Coke.—There is a fair demand for foundry coke for prompt shipment which is selling as high as \$14 per net ton at oven, the price being kept up to near the recent level in spite of the sharp decline in furnace coke. No contract prices are being quoted. Some Indianapolis by-product foundry coke was sold in this territory during the week on the basis of \$12.50, Connellsville, for delivery over three or four months. Furnace coke is quoted at \$10 to \$10.50 for prompt shipment. Coke shipments are now fairly good.

Finished Iron and Steel.—Buyers are holding off as much as possible awaiting developments in regard to the price regulation, and the demand in most lines is quiet. The proposal of Government regulation is having a tendency to keep prices down. The most active demand at present appears to be coming from the motor truck and tractor manufacturers whose plants are crowded with work. The White Co., Cleveland, is understood to have just closed an order with the French Government for several hundred motor trucks. No new inquiry has developed for steel for Government work. In structural lines, T. H. Brooks & Co. have taken the contract for an addition to the plant of the Illuminating Co., Cleveland, requiring 2000 tons of steel. Bethlehem sections will be used. John Gill & Sons, Cleveland, have taken a general contract for the Public Library building at Philadelphia. This will require 4500 tons of steel. The fabricating contract has not been placed. A local sale of a small lot of forging billets at \$120 at mill is reported. Standard rails have sold as high as \$89 for a car lot in the Cleveland market. The demand for plates continues active, and the Cleveland mill price is unchanged at 10c. for this year's delivery. Among new inquiries is one for 500 tons for export to China. Hard steel bars are quoted at 4.25c. There is practically no demand for iron bars. The sheet market is very firm and active. Considerable tonnage awaiting export shipment has been thrown on the market during the past few days because of the Government embargo. As it takes some time to secure Government license for export, the mills decided to sell these sheets and fill export orders from later rollings. Sheets are quoted at 8.50c. to 9.25c., Pittsburgh, for No. 28 black, 8.50c. to 9c. for No. 10 blue annealed, and 10.75c. to 11c. for No. 28 galvanized. Warehouse prices are 5c. for steel bars, 5.25c. for structural material, 9c. for plates, and 9c. for blue annealed.

Bolts, Nuts and Rivets.—The demand for bolts, nuts and rivets has quieted down. New rivet orders are coming largely from ship yards. No understanding has been reached as yet as to prices that will be charged for rivets used in making Government boats. Ship builders are trying to place orders for next year's delivery, but makers are declining to quote for delivery after Jan. 1. The output is being curtailed by a shortage of labor. We quote rivets at 5.25c., Pittsburgh, for structural, and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed from 5 to 10 per cent discount from these prices:

Common carriage bolts, $\frac{3}{4}$ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, $\frac{3}{4}$ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, \$1.90 off list; tapped, \$1.70 off list. Hexagon, h. p. nuts, blank, \$1.70 off; tapped, \$1.50 off. C. p. c. and t. hexagon nuts, all sizes blank, \$1.25 off; tapped, \$1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is inactive and weak. Heavy melting steel has declined about \$6 a ton, and there has been a sharp decline on other grades. Practically the only activity is between dealers and the trading between these is light, owing to the fact that they have about all covered on short sales, which helped to support the market for some time after prices began to move downward. Local dealers are offering \$32 for heavy melting steel scrap, although sales are reported as low as \$30. There is practically no demand for busheling, and dealers are offering around \$25 for this grade. Sales of borings and turnings are reported by Cleveland dealers in the Pittsburgh district at \$20, per gross ton. We quote f.o.b., Cleveland, as follows:

Per Gross Ton	
Steel rails	\$31.00 to \$32.00
Steel rails, rerolling	45.00 to 46.00
Steel rails, under 3 ft.	41.00 to 42.00
Iron rails	43.00 to 44.00
Steel car axles	50.00 to 52.00
Heavy melting steel	32.00 to 33.00
Carwheels	34.00 to 35.00
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	26.00 to 27.00
Railroad malleable	31.00 to 32.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton	
Iron car axles	\$48.00 to \$50.00
Cast borings	17.50 to 18.00
Iron and steel turnings and drillings	17.00 to 17.50
No. 1 busheling	25.00 to 26.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 cast	30.00 to 31.00
Railroad grate bars	21.50 to 22.00
Stove plate	20.00 to 21.00

Cincinnati

CINCINNATI, July 24—(By Wire).

Pig Iron.—Urgent calls for shipment of foundry iron on contracts previously made are now frequent. In most cases, this iron is needed, but in other instances it is simply a desire on the part of melters to lay in sufficient yard stocks to carry them through any future emergency that may arise to curtail the supply. No inquiries are out for anything except small lots of foundry iron for prompt shipment. Melters seem to have lost all interest in the first half of next year, and few, if any, contracts have been made for that delivery within the past week. Southern iron is not being firmly held at \$50, Birmingham, for this year's shipment, as sufficient resale iron has appeared at lower figures to take care of the small business that is offered. The absence of any sales of consequence renders it difficult to state what the minimum price for the first half is, and the slack inquiry has convinced furnace operators that it would be futile to attempt forcing the market under present conditions. The uncertainty as to the Government program for regulation of prices is undoubtedly the basic cause of the present situation. Northern iron is stagnant. The furnaces have practically none to offer for this year, with the exception of a few odd lots of off iron, and with comfortably filled order books they view the future with indifference. The principal trouble now is to move to old customers as fast as they need it. The Ohio silvery irons are unchanged, as far

as prices are concerned, with practically no sales of consequence to report. Based on freight rates of \$2.90 from Birmingham and \$1.26 from Iron-ton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft	\$51.40 to \$52.40
Southern coke, No. 2 f'dry and 2 soft	49.90 to 50.90
Southern coke, No. 3 foundry	49.40 to 50.40
Southern coke, No. 4 foundry	48.90 to 49.90
Southern gray forge	48.90 to 49.90
Ohio silvery, 8 per cent silicon	86.26 to 91.26
Southern Ohio coke, No. 1	56.26 to 57.26
Southern Ohio coke, No. 2	56.26 to 57.26
Southern Ohio coke, No. 3	55.26 to 56.26
Southern Ohio malleable Bessemer	56.26 to 57.26
Basic, Northern	56.26 to 57.26
Lake Superior charcoal	56.75 to 57.75
Southern carwheel foundry	48.90 to 49.90

(By Mail)

Finished Material.—Jobbers report that there is a general good business and the call for small structural material is encouraging for this time of the year. The large buildings now under construction and contemplated are, of course, provided for as far as structural material is concerned, but the demand for twisted steel bars shows that there is yet considerable work to be done before the coming winter. The construction of a number of Government temporary buildings in this vicinity has created a demand for nails and builder's hardware, but the total amount is not of much consequence. The jobber's price on nails this week is lower than last week and \$3.90 per keg base can be done on nails from stock, while the leading manufacturer is quoting \$3.20 per keg base, Pittsburgh, but this figure has not yet been met by the independents. Black and galvanized sheets are now getting too high for a great deal of work and as far as roofing is concerned, there is a strong tendency to substitute composition roofing in places where it has not heretofore been used. We quote No. 28 black sheets at 8.65c., Cincinnati or Newport, Ky., and No. 28 galvanized 10.65c. The jobber's quotation on steel and iron bars is unchanged at 5c. base, and on twisted steel bars 5.05c.; structural shapes, 5.25c. and $\frac{1}{4}$ -in. plates and heavier 9 $\frac{1}{2}$ c. Cold rolled shafting for which there seems to be a better demand is sold at the list price plus 15 per cent. Machine bolts $\frac{3}{4}$ x 4-in. and smaller are quoted from stock at 45 per cent discount, larger and longer 30 per cent discount. Round head steel rivets are unchanged at 5.05c. base and cone head rivets, 5.60c. The mill supply business has lately slackened to some extent.

Old Material.—Prices are still on the downward grade, and dealers report that the larger users of scrap, such as the rolling mills, are not willing to place orders just now. This hesitancy is said to be due entirely to the uncertainty of prices on finished material that might be regulated by the Government. Incoming shipments are a trifle light. The following are dealer's prices, f.o.b. at yards, southern Ohio and Cincinnati.

Per Gross Ton	
Bundled sheet scrap	\$20.00 to \$20.50
Old iron rails	35.00 to 35.50
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	38.50 to 39.00
Heavy melting steel scrap	33.50 to 34.00
Steel rails for melting	34.00 to 34.50
Old carwheels	31.00 to 31.50

Per Net Ton	
No. 1 railroad wrought	\$34.00 to \$34.50
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	24.00 to 24.50
No. 1 machinery cast	24.50 to 25.00
Burnt scrap	15.00 to 15.50
Iron axles	43.50 to 44.00
Locomotive tires (smooth inside)	37.00 to 37.50
Pipes and flues	18.00 to 18.50
Malleable cast	24.50 to 25.00
Railroad tank and sheet	16.00 to 16.50

Coke.—Reductions have been made on both furnace and foundry spot coke in all of the producing districts. However, contract figures in some instances seem to have gained strength. For instance, the average quotation on No. 48-hr. coke in the Connellsville field for future shipment range from \$9 to \$10 per net ton at oven and for immediate shipment \$10.50 to \$11. Foundry coke for future shipment in that field is around \$12 to \$13, and for spot movement from \$13 to \$14. These quotations will about fit in with those made in other fields where spot foundry coke is still held at a premium of about 50c. above the figures named for

Connellsville coke. The car situation is not giving as much trouble as the labor shortage and the hot weather is not a factor to alleviate this last named condition.

Birmingham

BIRMINGHAM, ALA., July 24 (By Wire).—The iron market is listless, but well sold up interests ask the same price as prevailed last week, and prompt iron sells around \$50, with some re-sale metal slightly lower. Last half ranges from \$48 to \$50. Apparently the lowest on 1918 iron is \$45.

(By Mail.)

Pig Iron.—Iron operators appear to agree that there is going to be Government regulation and, for that reason, incline to believe that the soaring process has stopped. Consumers are evidently awaiting developments. The inquiry during the week was scattering and there was little selling. One company had not entered an order between July 9 and July 20. The leading seller continues to quote \$45 and \$46 for 1918 delivery without especially seeking business. Sales on that basis have been made. This company's 1917 price is \$50. The leading seller of foundry iron is on a schedule of \$48 for 1918 with very little business being transacted. Spot iron is about as firm, owing to well-sold up condition of furnaces. One maker asked \$52 on a small prompt order, a price which the broker declined. The prompt minimum is around \$50, with the exception of a limited amount of resale iron available only in certain sections, which goes at \$49. There was a prompt sale by a furnace interest of a car of 3 per cent silicon at \$51, which is about \$49.50 No. 2 foundry basis. The Woodward Iron Co. is shipping 1200 tons of pig iron by rail to Sheffield, Ala., whence the consignee, who is understood to have either bought or leased a steamer and barges, is towing it up the Tennessee, Mississippi and Illinois rivers to Peoria, Ill., where the purchaser has a plant. Some of this iron, it is understood, will move on to Chicago via the drainage canal. It is the first shipment via that route. For two years the Sloss-Sheffield Steel & Iron Co. has shipped iron from its Florence and Sheffield furnaces up the Tennessee River to Metropolis, whence rails took it to destination in St. Louis, Chicago and northwestern consuming centers. Lack of transportation facilities and occasional low water have prevented this business assuming large proportions. The rates via both these river routes are lower than by all-rail. The Woodward Company has completed repairs on the Vanderbilt stacks, which will at once resume, giving that company five active stacks. Arrangements to repair and operate the furnaces of the Sheffield Coal & Iron Co. at Sheffield, Ala., are under way. W. L. Klutz, former manager of the Central Coal & Iron Co.'s plants at Holt, will be in charge. We quote per gross ton, f.o.b., Birmingham district furnaces, for prompt delivery as follows:

No. 1 foundry and soft.....	\$50.50 to \$51.50
No. 2 foundry and soft.....	50.00 to 51.00
No. 3 foundry	49.50 to 50.50
No. 4 foundry.....	49.25 to 50.25
Gray forge	49.00 to 50.00
Basic	50.00 to 51.00
Charcoal	55.00 to 56.00

Steel Bars.—Steel bars in carloads, f.o.b., Birmingham, 4.50c. to 4.75c.; iron bars, 4.20c. to 4.40c.

Cast Iron Pipe.—Cast iron pipe makers are principally concerned with the rush orders for the Government, which still keep plants busy. Other than the Government business, there has been little activity. Municipal business is conspicuous by its absence. We quote per net ton, f.o.b., Birmingham district plants, as follows: 4 in., \$63; 6 in. and upward, \$60, with \$1 added for gas pipe and extra lengths.

Coal and Coke.—There have been no changes in the coal or coke market for some time. Standard bee hive foundry coke is bringing \$11.50 to \$12 for contracts and \$14 to \$16 for spot. The shipments to Mexico as well as Pacific Coast are fairly regular. Steam coal brings \$2.50 to \$3, f.o.b., mines.

Old Material.—The scrap market has undergone more recessions and is considered weak when compari-

son is made with prices of pig iron. The entire list outside of steel axles and carwheels was trimmed again this week. We quote per gross ton, f.o.b., dealers' yards, as follows:

Old steel axles	\$50.00 to \$52.00
Old steel rails	28.00 to 29.00
No. 1 wrought	31.00 to 32.00
No. 1 heavy melting steel.....	23.00 to 24.00
No. 1 machinery cast.....	25.00 to 25.50
Carwheels	27.00 to 29.00
Tram carwheels	25.00 to 25.50
Stove plate and light	18.00 to 18.50
Turnings	12.50 to 13.00

St. Louis

ST. LOUIS, July 23.

Pig Iron.—Although reports are reaching here that agreements have been reached whereby the Government is to get its iron and steel at special prices, nevertheless the buyers and the sellers in this market are unwilling to commit themselves on contracts until a more definite state of affairs exists. In consequence, the sales of pig iron during the past week have been very light and the inquiries almost as insignificant. Such transactions as were closed were of little moment, such, for instance, as one car of No. 2 Southern for January delivery at \$48, Birmingham, and like quantities, deliveries and prices. It is doubtful whether more than 1000 tons were sold during the week of all grades and all deliveries. One feature of interest, however, was the appearance in this market of a considerable number of offers of certificates in 1000 to 1500 tons lots, apparently from brokers who have become nervous over their holdings and want to get rid of their responsibilities. They met with little encouragement, consumers preferring to await developments. Consumers holding contracts are urging forward their allotments sharply.

Old Material.—Absence of actual transactions makes quotations in the scrap market a very difficult matter—indeed the figures given are estimates rather than quotations, for so little business is being done that the dealers are getting anxious to sell at almost any price to keep expense of yard operation from eating too far into the capital account, especially as the aforesaid capital account has been sharply handicapped by the prices which have had to be paid for the most recent purchases. Consumers are melting their material rapidly, there having been no cessation of operations, but they have been content to reduce supplies in their yards or contracted for and await a settling of the situation and a return of prices to a more reasonable basis. Some industries are taking bargains where offered and these are getting more frequent as dealers are compelled to realize on holdings. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	\$39.00 to \$40.00
Old steel rails, re-rolling.....	42.00 to 43.00
Old steel rails, less than 3 ft.....	39.00 to 40.00
Relaying rails, standard section, subject to inspection.....	50.00 to 51.00
Old carwheels	33.00 to 33.50
No. 1 railroad heavy melting steel scrap	36.50 to 37.00
Heavy shoveling steel	28.00 to 28.50
Ordinary shoveling steel.....	27.00 to 28.00
Frogs, switches and guards cut apart	37.00 to 38.00
Ordinary bundled sheet scrap.....	18.50 to 19.00
Heavy axle and tire turnings.....	22.00 to 22.50

Per Net Ton	
Iron angle bars	\$36.00 to \$36.50
Steel angle bars	36.50 to 37.00
Iron car axles	43.00 to 43.50
Steel car axles	42.00 to 42.50
Wrought arch bars and transoms.....	40.00 to 40.50
No. 1 railroad wrought	33.50 to 34.00
No. 2 railroad wrought	31.00 to 31.50
Railroad springs	30.00 to 30.50
Steel couplers and knuckles	41.00 to 41.50
Locomotive tires, smooth inside, 42 in. and over	42.50 to 43.00
No. 1 dealers forge	28.00 to 29.00
Cast iron borings	14.50 to 15.00
No. 1 busheling	24.00 to 24.50
No. 1 boilers cut to sheets and rings.....	19.50 to 20.00
No. 1 railroad cast scrap	22.00 to 22.50
Stove plate and light cast scrap.....	17.00 to 17.50
Railroad malleable	27.50 to 28.00
Agricultural malleable	22.50 to 23.00
Pipes and flues	20.50 to 21.00
Heavy railroad sheet and tank scrap.....	20.00 to 20.50
Railroad grate bars	18.00 to 18.50
Machine shop turnings	14.00 to 14.50
Country mixed scrap	14.00 to 15.00

Coke.—A decidedly easier feeling has developed in coke and while spot is held at \$12 to \$14, Connellsville, for best selected 72-hour foundry grades buyers are finding little difficulty in getting supplies. No contract coke, however, is being signed up, neither the beehive ovens nor the by-product plants being willing to commit themselves in distant deliveries. Consumers, too, are willing to wait for a clearer atmosphere.

Finished Iron and Steel.—No new business is appearing in finished products and there is no desire to sell, either for prompt or future deliveries, the mills apparently being content to leave all new business to the warehouses, at least until the general situation is clearer. The movement out of warehouse is very free, up to capacity in fact, at the prices quoted, which meet with no objections. We quote for stock out of warehouse as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled, one pass, 9.85c.; No. 28 galvanized sheets, black sheet gage, 11.25c.

Buffalo

BUFFALO, July 23.

Pig Iron.—The Buffalo Union Furnace Co., which recently leased the blast furnace of the Burden Iron Co. at Troy, N. Y., is rapidly putting the stack in condition for operation and will start making iron some time in August. It has already sold a considerable portion of the output for the fourth quarter, with deliveries commencing at the time of blowing in. For the purpose of securing a "back log" of orders for the starting up of the furnace, this iron was offered at \$50 per ton at furnace; but so large a proportion of capacity for this year's delivery was quickly taken for New England points and for export that the company to-day announces that the price for the remainder of the output for this period will be advanced to \$55 in the immediate future. Aside from the above incident, the market is without important features, the few small sales made being for first half delivery and at last week's prices. Generally speaking, producers and users alike are waiting for definite decision, or manifestation, showing what the Government's attitude with respect to price-making is to be. We quote as follows for first quarter and first half 1918 delivery, f.o.b. furnace, Buffalo:

High silicon irons	\$55.00 to \$56.00
No. 1 foundry	54.00 to 55.00
No. 2 X foundry	53.00 to 55.00
No. 2 plain	52.00 to 54.00
No. 3 foundry	51.00 to 53.00
Gray forge	51.00 to 53.00
Malleable	53.00 to 55.00
Basic	53.00 to 55.00
Lake Superior charcoal, f.o.b. Buffalo.	55.00 to 60.00

Old Material.—Very few sales of any tonnage have been made during the week and business transacted was comprised principally material on cars that dealers preferred to move at concession prices rather than to place in stock. Lack of demand from mills has caused further shrinkage in prices covering, with few exceptions, the entire list, and such new business as is done at present is largely between dealers. Nearly every dealer has unfilled orders on his books at the high prices prevailing during the last month or two sufficient in volume to cover the period of dullness in new demand which is expected to prevail for the remainder of July and possibly all through August and absorb available tonnage. Consequently, dealers are bending their efforts to completing existing orders rather than endeavoring to place new business. The prices quoted below are largely nominal, but represent dealers' asking prices per gross ton, f.o.b. Buffalo:

Heavy melting steel	\$24.00 to \$35.00
Low phosphorus	48.00 to 50.00
No. 1 railroad wrought	46.00 to 48.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	50.00 to 55.00
Steel axles	50.00 to 55.00
Car wheels	35.00 to 37.00
Railroad, malleable	32.00 to 33.00
Machine shop turnings	18.00 to 19.00
Heavy axle turnings	26.00 to 27.00
Clean cast borings	20.00 to 21.00
Iron rails	43.00 to 44.00
Locomotive grate bars	22.00 to 23.00
Stove plate	20.50 to 21.00
Wrought pipe	30.00 to 31.00
No. 1 busheling scrap	31.00 to 32.00
No. 2 busheling scrap	21.00 to 22.00
Bundled sheet stamping scrap	21.00 to 21.50

Finished Iron and Steel.—The market is absolutely quiet, as sales agencies, as a rule, are selling nothing except a few odds and ends. Dead calm in buying prevails, while both sellers and buyers await developments from Washington. There is apparently less inclination to do business by either the mills or consumers than was noted a week ago, when the waiting policy began to be strongly entrenched.

The Donner Steel Co., this city, announces that its new plate mill will be placed in operation this week.

British Steel Market

Ferromanganese Higher for 1918—Maximum Tin-Plate Price Fixed

LONDON, ENGLAND, July 25.—(By Cable.)

The pig-iron market is firm with hematite iron in active and general demand. More furnaces are expected to start soon. Tin plates are nominal with the basis price for the home trade officially fixed at 30s. net at makers' works. American wire rods for early shipment have been sold at £29 c.i.f. Ferromanganese is strong at \$400 c.i.f., quoted for delivery in the first half of 1918. We quote as follows:

Tin plates, coke 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Black sheets, £21 5s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Government Controls Nearly Every Branch—Ferromanganese Position Acute

LONDON, ENGLAND, July 3.—Concentration of productive capacity on war requirements is becoming intensified. There is no end of orders confronting steel plants, so that merchant trade is suffering. Attempts are being made to carry this on by the use of shell discards, the available supply of which is eagerly snapped up, and does not go very far. Apart from huge Government demands, the speeding up of the mercantile shipping program continues. Government control now extends to practically every branch of the steel industry, and overseas' merchant business is paralyzed.

In pig iron, conditions continue irregular with further evidence of ease regarding the supply of foundry and forge descriptions. The output of Cleveland iron is ample, and there has been further improvement in the clearances to the Continent. There is less pressure on the English foundries, and it is possible a larger tonnage will be released to the Allies, whose demands continue heavy, while this month's home needs will be lighter due to the Scottish holidays. Additional pressure has been put upon hematite producers and current output is moving into consumption rapidly. Every effort is being made to develop output in order to cope with the intense domestic and foreign demand.

Semi-finished steel is tight. The great bulk of the output is being systematically absorbed by Government needs. The surplus supply of Welsh sheet bars is small. In American material, business in billets remains completely at a standstill while only few and limited transactions have been heard of lately in wire rods on c.i.f. terms varying between £28 and £30.

The supply of raw material reaching the finishing branches falls short of requirements. Official prices are unchanged, although the tendency outside the control has been firmer with irregular fluctuations. The question of terms is now a secondary consideration, due to the demand far outstripping the supply.

Steel Companies Combining

There have been further developments to combine interests. It is understood that negotiations have now been pretty well completed for the amalgamation of the Frodingham Iron & Steel Works with the Steel, Peech & Tozer and Samuel Fox, consumers of Sheffield, which were amalgamated about a year ago. The new combination will now have their own supply of pig iron as the Frodingham works are located on rich ore fields with good supplies of lime and ironstone. It is sug-

gested that this union will include one-half of the Appleby property in Lincolnshire, which was acquired a few years back by the Frodingham company in conjunction with the Steel Co. of Scotland.

The position of ferromanganese is more acute. Special licenses for export are practically confined to United States and Canadian ports. F.o.b. quotations are virtually nominal although up to £68 has been bid for forward shipment to Continental ports. Sellers are very scarce and ask up to £80 for shipment next year. Some business has been done recently at \$350, c.i.f. North American ports, and sellers are now asking \$375 to \$400.

There is some demand for Indian manganese ores, but business is badly handicapped by lack of tonnage and the market is much firmer.

Demand for tin plates is in excess of the supply and the tone is strong. Urgent orders estimated at about 80,000 boxes were placed quite recently for immediate and early shipment to France, and the United States has also made sales to France. There is a heavy drain on makers' stocks and the scarcity of offers for near months is more pronounced, while works are frequently fully booked into the autumn. The outlook for consumers is going from bad to worse because of small output and threatened exhaustion of stocks. Execution of urgent orders by packers is seriously handicapped. Current quotations are now on the basis of about 35s. per basis box, f.o.b. Wales, and stock lots free from permit restrictions command a big premium, with sales round about 40s.

New York

NEW YORK, July 25.

Pig Iron.—Except for fill-in lots of very moderate tonnages, there is no demand for pig iron for domestic consumption. Some iron is being offered for resale at lower prices than recently quoted, but furnaces are adhering to their quotations and are not worried about the future. In fact, they are glad to have a little breathing spell. Pressure for deliveries is as strong as ever, and the railroad situation as to cars shows little, if any, improvement. Alabama iron has been resold for prompt delivery at \$48 Birmingham for No. 2 foundry. Some iron has been sold in the Buffalo district at \$50 furnace, and is understood to be from a furnace soon to be blown in. A sale of 3000 tons has been made for shipment to Japan and will be shipped via San Francisco. Inquiries amounting to from 25,000 to 30,000 tons of foundry and steel-making irons are pending. We quote tidewater for prompt delivery as follows:

No. 1 foundry.....	\$54.25 to \$55.25
No. 2 X.....	53.75 to 54.75
No. 2 plain.....	53.25 to 54.25
Southern No. 1 foundry.....	52.75 to 53.75
Southern No. 2, foundry and soft....	52.25 to 53.25

Cast Iron Pipe.—The market is dull, with no municipal business of importance pending. Cast iron pipe plants are being called upon to furnish fittings for wooden pipe which is to be installed in Government cantonnments. Carloads of 6-in., 8-in. and heavier are quoted at \$65.50 per net ton tidewater and 4-in. at \$68.50.

Ferroalloys.—The ferromanganese market is quiet and quotations are unchanged from those of last week. For early delivery \$400 is asked, with \$375 and \$350 the ruling prices for last quarter of this year and first half of next year respectively. Sales of several hundred tons of domestic alloy for delivery in the first half have been made at \$350. Receipts of the British alloy for June, from reports furnished THE IRON AGE from three of the five ports of entry indicate a smaller importation than was expected or not much of any in excess of 3000 tons. No further reports of submarine losses of the alloy are noted. Spiegeleisen is strong but quiet at \$85, furnace, for 20 per cent, delivery this year. Ferrosilicon, 50 per cent, is in active demand for large quantities for delivery abroad next year. The quotation continues at \$130 for 1918 delivery with \$200 to \$225 asked for material needed for early delivery.

Structural Material.—Outside of Government contracts the general situation is quiet. Large fabricators are disinclined to furnish material for anything outside of that necessary for war purposes or those allied thereto. A number of projects for new theaters will reach maturity if steel can be obtained and it is also noted that owing to the large demand for apartment houses at even higher rents projects of this kind would go forward if it were thought possible to obtain the steel, no matter if the price is high. Government contracts recently awarded are the following: The American Bridge Co. has taken 700 tons for additions to Bancroft and Isherwood halls at the Naval Academy, Annapolis, Md., from the general contractor announced as low bidder two weeks ago; the same company will probably furnish the 2400 tons for the new projectile plant for the Government at Charleston, W. Va., from the low bidder, Warren Moore & Co., Philadelphia. It is estimated that the awards have all been made for the remainder of the 40 or more magazines in various parts of the country, the McClintic-Marshall Co. having taken about 1900 tons in addition to 400 tons already announced as awarded to the American Bridge Co. for the same purpose. For the stables and garage for the League Island Navy Yard, involving a small tonnage, William Linder is low bidder, and for eight magazines at Lake Denmark the Columbus Circle Construction Co. is named as low bidder. In addition to the foregoing the American Bridge Co. has taken 300 tons for three bridges for the Pennsylvania Railroad and the same railroad is inquiring for 250 tons for two bridges. Several manufacturing plants are taking bids on about 1700 tons for plant extensions and a few of the railroad companies are in the market for a small amount of steel for bridges and other necessary work. We quote plain material from mill at 4.669. to 5.169c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5c. to 5.25c. per pound, New York, according to sizes desired.

Plates.—The French Mission, through J. P. Morgan & Co., is purchasing 50,000 tons of plates, of which about 25,000 had been placed up to Tuesday. Shipments in September and October have been specified, the United States Government asking the mills to give these deliveries owing to the urgent need of the French Government, which will use the plates for naval vessels and for barges for carrying supplies on the rivers and canals. On hull steel the low bid is said to have been 7c., while 13c. was asked for boiler plate, but these prices were not low enough to satisfy our Government, and the mills taking the business finally accepted 6c. for the hull steel and 9c. for boiler plates. The tonnage placed was pretty well split up among a number of mills. The contracts which J. P. Morgan & Co. offered the mills specify that if for any reason shipment is delayed and it becomes necessary to store the plates, the mills shall receive 90 per cent of the purchase price at the time they are placed in storage. One concern has also asked that \$2 per ton a month be paid if storage becomes necessary. The United States Government has sent requisitions to the mills for plates for 24 submarines and 24 torpedo boat destroyers, which will be built at various shipyards. It is said that there will be a distribution of large requisitions for steel plates for Government merchant ships very soon by the committee of the American Iron & Steel Institute, which has this matter in charge. The Government has sent out requisitions for plates for locomotives being built by the American Locomotive Co. and the Baldwin Locomotive Works for the Russian Government. There are still inquiries in the market for plates for the Japanese shipbuilding interests, but mills are declining to quote on this business in view of the attitude of this Government, which at the present time is said not to be favorable to the granting of export licenses for steel which was not in some stage of manufacturing on or before July 15, when the export embargo went into effect. The mills have a great deal of Japanese business on their books, and feel that neither they nor the Japanese have anything to lose by waiting until this tonnage is fairly well cleaned up.

Some of this business is for shipment within the next few months, while many orders on the books are for deliveries as far ahead as the second quarter of 1918. It is reported that the Japanese Commission, now on its way to the United States, will bring with it lists of steel for large requirements of that country, and orders will be placed here providing a satisfactory agreement is reached with our Government as to shipments. Domestic business is virtually at a standstill. The South Buffalo Railway is reported to have ordered 300 steel hopper cars from the American Car & Foundry Co. Nominal prices on mill shipments, if a mill could be found to accept the business, are 10c. Pittsburgh for tank quality and 12c. to 12½c. for ship steel. On resales prices are whatever buyer and seller may agree upon, but there are few buyers this week at any price. On mill shipments, we quote on tank plates 10.169c., New York, and ship plates, 12.169c., New York. Plates out of store are 8c. to 9c. for tank plates and 8.50c. to 9.50c. for ship plates.

Rails and Track Supplies.—The French railroads are in the market for a large tonnage of rails and track supplies, which, it is reported, are wanted for early shipment to France to be ready for a party of about 1000 American railroad men going abroad to assist in the rehabilitation of France's railroad system, which has been seriously affected by the strain of war transportation. It is understood that the French Mission has asked steel mills to delay orders for shell steel now on their books and give them the rails and track supplies instead.

Iron and Steel Bars.—The steel bar market is very quiet. Few concerns have any steel bars to sell for deliveries which would interest the average buyer. The bar iron market is active, and contracts are extending into the first quarter of next year. Many jobbers have not as yet closed for their fourth quarter requirements. We continue to quote steel bars in mill shipments at 4.669c. to 5.669c., New York, and bar iron at 4.919c. to 5.169c., New York. From New York district warehouses, steel bars are sold at 5c., and bar iron at 5c. to 5.50c.

Old Material.—The scrap market, except for foundry grades, is very much depressed and prices have been marked down rapidly. Heavy melting steel for shipment to Pittsburgh is now quoted at \$28 to \$29. There is very little demand even at that price. Sharp declines have taken place in rerolling rails, car axles and wrought iron track scrap. Brokers quote buying prices as follows to local producers and dealers per gross ton New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania).....	\$29.00 to \$30.00
Old steel rails (short lengths) or equivalent heavy steel scrap.....	28.00 to 29.00
Relaying rails	65.00 to 70.00
Re-rolling rails	39.00 to 40.00
Iron and steel car axles.....	42.00 to 43.00
No. 1 railroad wrought.....	42.00 to 43.00
Wrought-iron track scrap.....	32.00 to 33.00
No. 1 yard wrought long.....	32.00 to 33.00
Light iron	10.00 to 12.00
Cast borings (clean).....	18.00 to 19.00
Machine-shop turnings	18.00 to 19.00
Mixed borings and turnings.....	16.50 to 17.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)....	31.00 to 32.00

Despite the very marked weakness in other grades, cast-iron scrap is holding up very well and quotations do not show much change. Dealers in New York City and Brooklyn are quoting as follows to local foundries per gross ton:

No. 1 machinery cast.....	\$34.00 to \$35.00
No. 1 heavy cast (column, building material, etc.)	29.00 to 30.00
No. 2 cast (radiators, cast boilers, etc.)	28.00 to 29.00
Stove plate	20.00 to 21.00
Locomotive grate bars.....	20.00 to 21.00
Old carwheels	33.00 to 34.00
Malleable cast (railroad).....	33.00 to 34.00

Fire, July 21, at No. 1 furnace of the Wharton Steel Co., Dover, N. J., caused a loss estimated at \$20,000. The fire was caused by the failure of a floor in the furnace building, and resulted in the death of one employee and injury to eight others.

WILL BUILD LARGE PLANT

Curtiss Corporation Breaks Ground for the First Two Units

The Curtiss Aeroplane & Motor Corporation broke ground in Buffalo Tuesday for the first two units of a new factory, which when entirely completed will represent a cost of about \$5,000,000. William A. Morgan, vice-president and general manager of the reorganized airplane company, of which John N. Willys of the Willys-Overland Co., is president, and Glenn H. Curtiss chairman of the board of directors, said that the company's plans contemplate the erection of an immense plant with about 1,000,000 sq. ft. of floor space to cost approximately \$5,000,000. Employment will be given to 15,000 men.

The units now being built are the metalworking and woodworking shops, each to be of about 100,000 sq. ft. and of steel and concrete construction. The site for the plant comprises 33 acres, on which an option was exercised only last Saturday. The Austin Co. of Cleveland, and Bridgeport, Conn., has the contract for the buildings and promises to have the first two completed in 45 days. An experimental airplane laboratory will soon be erected somewhere on Long Island by Mr. Curtiss, who is in charge of airplane experiments.

During the past week the Curtiss corporation has sold to stockholders \$2,100,000 worth of shares of common stock, the issuance of which was authorized at a recent meeting of the board of directors. It is stated that the Curtiss corporation is assured of about \$150,000,000 worth of airplane contracts.

The Wright-Martin Aircraft Corporation, which has been expecting a Government contract, is said to have received a trial order for 500 Hispano-Suiza airplane engines. The General Vehicle Co. is at work on a large number of Gnome rotary motors and a number of other plants, including a great many automobile factories, are making parts of the U. S. A. 200-hp. motor, with which experiments will be made to determine its serviceability for battle planes.

Buy Coal Properties

M. A. Hanna & Co., Cleveland, has purchased the entire anthracite coal properties, including mines and collieries, of the Pennsylvania Railroad, and will operate these properties and market the product. The greater part of the coal property involved has been operated by the Susquehanna Coal Co. The output of the mines transferred is said to be about 5 per cent of the entire anthracite production of the country. The sale is the result of the decision of the Pennsylvania Railroad some time ago to dispose of its interests not directly concerned in the transportation service. Another important transfer of coal properties was announced this week. This is a sale by Pickands, Mather & Co., Cleveland, of 1500 acres of coal land in Belmont County, Ohio, to the Clarkson Coal & Dock Co., St. Paul, Minn. It is stated that \$5,000,000 was involved in this transaction.

To Buy 20,000 Browning Machine Guns

WASHINGTON, July 24.—The purchase of 20,000 Browning automatic rifles, made in accordance with the revised model of this arm, has been approved by the Machine Gun Board of the War Department. Of these guns 10,000 are to be of the light and the remainder of the heavy type, the former being designed to be carried by infantry and used in the front line trenches. The board has also recommended the purchase of 25,000 Lewis machine guns. These guns will be available for use for the infantry and for mounting on airplanes. It is understood that the most effective of the German fighting airplanes carry from one to three Lewis guns.

The Keith Furnace Co., Des Moines, Iowa, has purchased a site for a new factory building, which will be erected some time within the next four years, when the lease of its present building expires.

IRON AND INDUSTRIAL STOCKS

Unexpected Advance in Money Rates Was Feature of the Week

The most interesting feature of the stock market last week was a rapid advance in money rates, which on Monday carried the price of call loans up to 10 per cent. Most of the day's business was done at lower rates, but considerable money was loaned at 8 per cent or higher. The unexpected advance was attributed to the Government's withdrawals of cash from the banks. The situation improved rapidly and call money later in the week did not command more than 6 per cent. There was much irregularity in a number of stocks throughout the week. United States Steel moved through a range of five points, but closed the week with a change of only one-eighth point, as compared with the close of the preceding week. Money now promises to be plentiful.

Among the industrial stocks that registered gains during the past week were the following: American Can, $\frac{3}{4}$; American Car & Foundry, $\frac{1}{2}$; American Locomotive, $1\frac{1}{4}$; Baldwin Locomotive, $1\frac{5}{8}$; Bethlehem Steel, 2; Bethlehem Steel, Class B, $2\frac{1}{2}$; Colorado Fuel & Iron, $\frac{1}{2}$; Crucible Steel, $1\frac{1}{4}$; Lackawanna Steel, $2\frac{1}{2}$; Midvale Steel, $2\frac{1}{2}$; National Enameling & Stamping, $1\frac{1}{4}$; Pressed Steel Car, 2; Republic Iron & Steel, $3\frac{3}{4}$; United States Steel, $\frac{1}{2}$; United States Steel Preferred, $\frac{1}{4}$. Among the stocks that made losses during the week were the following: Gulf States Steel, 3; International Harvester, $\frac{3}{4}$. Allis Chalmers and American Steel Foundries remained the same at the end of the week as at the beginning, the former being at 29 $\frac{3}{4}$ and the latter at 68 $\frac{1}{2}$.

The range of prices on active iron and steel stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	28 $\frac{1}{2}$ - 29 $\frac{1}{2}$
Allis-Chal., pref.	83 - 83 $\frac{1}{4}$
Am. Can., com.	46 $\frac{3}{4}$ - 49 $\frac{3}{4}$
Am. Can., pref.	106 $\frac{1}{4}$ - 107
Am. Car & Fdry., com.	74 $\frac{3}{4}$ - 76 $\frac{3}{4}$
Am. Car & Fdry., pref.	116 $\frac{1}{4}$ - 116 $\frac{1}{2}$
Am. Loco., com.	68 $\frac{3}{4}$ - 72 $\frac{3}{4}$
Am. Loco., pref.	102 - 103
Am. Rad., com.	280
Am. Radiator, pref.	133
Am. Ship, com.	83
Am. Steel Fdries. 66	- 68 $\frac{1}{2}$
Bald. Loco., com.	66 $\frac{3}{4}$ - 71 $\frac{1}{2}$
Bald. Loco., pref.	100 $\frac{3}{4}$ - 100 $\frac{3}{8}$
Beth. Steel, com.	129 - 132
Beth. Steel, class B	123 - 129 $\frac{1}{2}$
Carbon Stl., com.	94 - 98
Case (J. I.), pref.	80
Central Fdry., com.	34 - 35
Charcoal Iron, com.	85 $\frac{3}{8}$ - 87 $\frac{3}{8}$
Chic. Pneu. Tool.	70 - 70 $\frac{1}{4}$
Colo. Fuel	47 $\frac{3}{4}$ - 50
Cruc. Steel, com.	77 $\frac{3}{4}$ - 82 $\frac{3}{4}$
Cruc. Steel, pref.	102 $\frac{1}{4}$ - 103
Gen. Electric	149 $\frac{3}{4}$ - 156
Gt. No. Ore. Cert.	32 - 34 $\frac{1}{2}$
Gulf States Steel	115 - 120
Int. Har. of N. J., com.	111 - 114 $\frac{3}{4}$

Int. Har. of N. J., pref.	118
Int. Har. Corp., com.	72 $\frac{1}{2}$ - 75 $\frac{1}{4}$
Int. Har. Corp., pref.	105
Lackawanna Stl.	89 $\frac{1}{4}$ - 93 $\frac{1}{2}$
Lake Sup. Corp.	17 - 18 $\frac{1}{2}$
Lima Loco.	56
Lukens, 1st pref.	102 $\frac{1}{2}$
Midvale Steel	57 $\frac{3}{4}$ - 60 $\frac{1}{2}$
Nat.-Acme	34 - 34 $\frac{1}{2}$
Nat. En. & Stm., com.	40 $\frac{1}{2}$ - 44 $\frac{3}{4}$
N. Y. Air Brake	128 - 132
Nova Scotia Stl.	94 - 95
Pitts. Steel, pref.	100 - 100 $\frac{1}{4}$
Pressed Stl., com.	70 $\frac{3}{4}$ - 73 $\frac{1}{4}$
Ry. Steel Spring, com.	51 - 52
Ry. Steel Spring, pref.	98 - 98 $\frac{3}{4}$
Republic, com.	86 - 92 $\frac{1}{4}$
Republic, pref.	102 $\frac{1}{4}$ - 102 $\frac{1}{2}$
Sloss, com.	52 - 53
Sup. Steel	43 - 45
Sup. Steel, 1st pref.	102 - 102 $\frac{1}{2}$
Transue-Williams	43
Un. Alloy Steel	42 $\frac{1}{4}$ - 43 $\frac{1}{2}$
U. S. Pipe, com.	20 $\frac{3}{4}$ - 21
U. S. Steel, com.	118 $\frac{3}{4}$ - 123 $\frac{3}{4}$
U. S. Steel, pref.	117 $\frac{3}{4}$ - 118 $\frac{3}{4}$
Va. I. C. & Coke	66
Warwick	9 $\frac{1}{4}$
Westing. Elec.	48 - 49 $\frac{3}{8}$

Pittsburgh Rolls Corporation

It is expected that on Aug. 1 details will be closed by which the business of the Phoenix Roll Works, at Pittsburgh, operated for about 60 years by the Seaman-Sleeth Co., will be transferred to a new interest, to be known as the Pittsburgh Rolls Corporation. The new company will be capitalized at \$3,000,000 of which \$1,000,000 will be 6 per cent first mortgage gold bonds, \$500,000 7 per cent cumulative preferred stock, and \$1,500,000 common stock. There is also \$1,000,000 common stock, reserved for conversion of bonds. The Seaman-Sleeth Co. was organized originally in a small way, and has steadily grown for over 60 years, having, it is stated, net assets at present of \$1,700,000. For about 47 years, the company has specialized largely in the manufacture of chilled and sand iron rolls and pinions, used by steel and iron works. It has a large trade among the leading steel companies in this country, and has also exported for some years large quantities of rolls to Canada, Mexico, Australia and Japan. The

net profits of the company for the five years 1912-1916 are given as \$742,992.57. The net earnings for the year 1916 alone, which was the most prosperous in the history of the company, are given as \$296,144.58. The net profits for the first four months of 1917 are given as \$104,993.59. The company is now adding a large new open-hearth furnace, which, it is expected, will increase its output fully 50 per cent. The management of the Pittsburgh Rolls Corporation, it is stated, will remain practically the same as in the former Seaman-Sleeth Co. J. S. Seaman, who has been president of the Seaman-Sleeth Co. for many years, will be chairman of the board of directors of the Pittsburgh Rolls Corporation, and David L. Eynon, who was general manager of the same company for many years, will be president.

Industrial Finances

The earnings of the Port Arthur Shipbuilding Co., Port Arthur, Ont., are reported as being extremely satisfactory, with raw material arriving ahead of requirements. The company now has contracts on its books prior to the close of navigation in 1918, which total approximately \$6,000,000. A few months ago this company commenced the erection of a large addition to its plant so as to double the output and rapid progress is being made on the undertaking. The company has recently received large orders for ships for the Imperial Munitions Board and Dominion Government.

The Electric Steel & Engineering Co., Welland, Ont., recently incorporated with a capital stock of \$2,000,000, is the merger of three concerns. The three companies included in the corporation are the Electric Steel & Metals, Ltd., of Welland; the Boving Hydraulic Engineering Co. of Lindsay, Ont., and the Wabi Iron Works of New Liskeard, Ont. No announcement as to plans will be made until after a meeting of directors, which is to be held shortly.

The Termaat & Monahan Mfg. Co., Oshkosh, Wis., has been duly authorized to succeed to the business of the Termaat & Monahan Co., Oshkosh, which has been in the hands of a receiver about eight months. The plant, manufacturing marine and other types of gasoline engines, lathes and machinery of all kinds, has been operated to a small extent under a temporary lease, pending the reorganization, and will now be reopened with a full crew. The new company was formed by the reorganization committee of stockholders and paid \$30,000 in cash, assuming all encumbrances.

Involuntary bankruptcy proceedings have been begun against the Chattanooga Iron Works, Chattanooga, Tenn. Petitioners have claims aggregating about \$6,200. No estimate of liabilities or assets are made.

In paying up all back dividends on its preferred stock, the last 2 per cent being payable Aug. 31, the Crucible Steel Co. of America, Pittsburgh, will have paid out \$7,875,000 in accumulated disbursements. The last declaration brings the total to 14 $\frac{1}{4}$ per cent this year in addition to 13 per cent paid off late last year. Net earnings in the fiscal year ending Aug. 31, last, were \$13,223,655, or 46 per cent on the common. The preferred rate is 7 per cent or \$1,750,000. It is expected that this company will soon start paying dividends on its common stock, but nothing official about this has been given out.

Dividends

The Atlantic Steel Co., extra 5 per cent on the common, payable Aug. 2.

The Canadian Locomotive Co., quarterly, 1 $\frac{1}{2}$ per cent on the common, and 1 $\frac{1}{4}$ per cent on the preferred.

The Cleveland-Cliffs Iron Co., quarterly, 2 $\frac{1}{2}$ per cent, payable July 25.

The Crucible Steel Co. of America, 2 per cent on account of accumulated dividends on the preferred, payable Aug. 31.

The Pittsburgh Steel Co., quarterly, 1 $\frac{3}{4}$ per cent on the preferred, payable Sept. 1.

The Republic Iron & Steel Co., quarterly, 1 $\frac{1}{2}$ per cent on the common, payable Nov. 1, and 1 $\frac{3}{4}$ per cent on the preferred, payable Oct. 1.

The Stewart-Warner Speedometer Corporation, quarterly, 1 $\frac{1}{2}$ per cent on the common, payable Aug. 15.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 76.1c., minimum carload, 40,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 60,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, 1/4 in. thick and over, and zees 3 in. and over, 4.50c.

Wire Products

Wire nails, \$4 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire is \$4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$3.95; galvanized wire, \$4.65; galvanized barbed wire and fence staples, \$4.85; painted barbed wire, \$4.15; polished fence staples, \$4.15; cement-coated nails, \$3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent, small cut thread, 35 and 2 1/2 per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, \$2.10 off list, and tapped, \$1.90 off; hex., blank, \$1.90 off, and tapped, \$1.70 off; nuts, c. p. c. and t. sq. blank, \$1.70 off, and tapped, \$1.50 off; hex. blank, \$1.60 off, and tapped, \$1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at \$95 to \$100; high-carbon rods made from ordinary open-hearth steel, \$100 to \$110, and special steel rods with carbons running from 0.40 to 0.60, \$100 to \$110 at mill; above 0.60 carbon, \$115 to \$120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, \$5.00 base; 3/4 in., 7/16 in. and 1/2 in., \$7.50 to \$8. Boat spikes are about 6.50c. to 7c. all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above these prices. Track bolts with square nuts 6.50c. to 7c. to railroads, and 8c. to 8.50c. in small lots, for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails: 25 to 45 lb., \$75 to \$80; 16 to 20 lb., \$80 to \$81; 12 and 14 lb., \$82 to \$83; 8 and 10 lb., \$83 to \$84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, \$38; open-hearth, \$40, per gross ton, Pittsburgh.

Tin Plate

Long terne plate, No. 28 gage, base, \$7.25 to \$7.50; short terne plate, \$12 to \$12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, \$14 per package; 8-lb., 214 sheets, \$14.30 per package; 12-lb., I. C., \$15.25 per package; 15-lb., I. C., \$15.75 per package; 20-lb., I. C., \$16.50; 25-lb., I. C., \$17.25; 30-lb., I. C., \$18; 35-lb., I. C., \$18.75; 40-lb., I. C., \$19.50.

Iron and Steel Bars

Steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c.; railroad test bars, 5.25c. in carload lots and larger lots f.o.b. mill.

Wrought Pipe

The following discounts in steel are to jobbers for carloads on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube, which adheres to card of April 1.

Butt Weld

Steel				Iron			
Inches	Black	Galv.		Inches	Black	Galv.	
1/4, 1/4 and 3/8	42	15 1/2		1/4 and 1/4	23		+4
1/2	46	31 1/2		3/8	24		+3
3/4 to 3	49	35 1/2		1/2	28		10
				3/4 to 1 1/2	33		17

Lap Weld

Inches	Black	Galv.	Inches	Black	Galv.
2	42	29 1/2	2	26	12
2 1/2 to 6	45	32 1/2	2 1/2 to 6	28	15
7 to 12	42	28 1/2	7 to 12	25	12
13 and 14	32 1/2				
15	30				

Butt Weld, extra strong, plain ends

Inches	Black	Galv.	Inches	Black	Galv.
1/4, 1/4 and 3/8	38	20 1/2	1/4, 1/4 and 3/8	22	5
1/2	43	30 1/2	1/2	27	14
3/4 to 1 1/2	47	34 1/2	3/4 to 1 1/2	33	18
2 to 3	48	35 1/2			

Lap Weld, extra strong, plain ends

Inches	Black	Galv.	Inches	Black	Galv.
2	40	28 1/2	2	27	14
2 1/2 to 4	43	31 1/2	2 1/2 to 4	29	17
4 to 6	42	30 1/2	4 1/2 to 6	28	16
7 to 8	38	24 1/2	7 to 8	20	8
9 to 12	33	19 1/2	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5 1/2 points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel	Standard Charcoal Iron
1 1/4 and 2 in.	31
2 1/4 in.	28
2 1/2 and 2 3/4 in.	34
3 and 3 1/4 in.	34
3 1/2 to 4 1/2 in.	34
5 and 6 in.	33
7 to 13 in.	30
	23
	35
	32
	38
	43
	No quotations
	37
	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1 1/4 in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, \$5 per ton above these prices.]

Blue Annealed—Bessemer

Nos.	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos.	Cents per lb.
Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 8.95
No. 28	8.50 to 9.00
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos.	Cents per lb.
Nos. 10 and 11	9.00 to 9.50
Nos. 12 and 14	9.10 to 9.60
Nos. 15 and 16	9.25 to 9.75
Nos. 17 to 21	9.40 to 9.90
Nos. 22 and 24	9.55 to 10.05
Nos. 25 and 26	9.70 to 10.20
No. 27	9.85 to 10.35
No. 28	10.00 to 10.50
No. 29	10.25 to 10.75
No. 30	10.50 to 11.00

Tin-Mill Black Plate—Bessemer

Nos.	Cents per lb.
Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 to 24	7.90 to 8.40
Nos. 25 to 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30 1/2 and 31	8.10 to 8.60

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery							
Copper, New York Tin.		Lead		Spelter			
July	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
18.....	26.50	26.50	62.62½	10.37½	10.25	8.87½	8.62½
19.....	26.50	26.50	62.50	10.25	10.12½	8.75	8.50
20.....	26.50	26.50	62.50	10.00	10.00	8.62½	8.37½
21.....	26.50	26.50	10.00	10.00	8.75	8.50
22.....	26.50	26.50	62.50	10.00	10.00	8.75	8.50
23.....	26.50	26.50	62.50	10.25	10.25	8.75	8.50
24.....	26.00	26.00	62.50				

NEW YORK, July 25, 1917.

Probable Government purchases and price regulations continue the dominant factor. Business is light and prices largely nominal. Copper is nominally a little lower but steadier. Tin is very quiet but fairly firm. Lead has been weak but is growing stronger. Spelter is still very quiet but a little firmer. Antimony still declines.

New York

Copper.—In the past week very little business has been reported, hardly enough to establish a market. Prices are nominal and are made by offerings and not by transactions. The influences controlling the situation are the same as those discussed last week and definite information as to Government policy and prices seems as far away as ever. Under the circumstances buying is only from hand to mouth and very cautious. The only interesting feature is a drop in the London market the past week of £5 per ton, spot electrolytic being now quoted at £137 with futures at £133. The effect of this fall in price is expected in some quarters to have a beneficial influence in bringing about a closer co-operation in prices between large and small producers in this country. With exports of copper for June estimated at 40,000 tons the total for the first half of this year will be 265,967 tons, or nearly twice those for the same six months of 1916 when they were 147,943 tons. Refinery production of copper for June is estimated at 200,000,000 lb. with the total for the first half of this year at 1,055,000,000 lb. Some business for September-October delivery is reported at 24.50c. to 25.50c. with the quotation for the last quarter generally regarded as 24c. The price of Lake and electrolytic copper yesterday was 26c., New York. The strike situation is not regarded as very serious.

Tin.—The tin market has been dull and quiet the entire week. Sales have been moderate, made up mostly of early shipments from England and future shipments from the Straits Settlements. The market is almost a nominal one at 62.50c. New York. Sellers and buyers are generally cautious, but there has been some desire to sell in some places. The feature of the market has been the scarcity of spot tin, caused by an unwillingness to grant permits in England, and to the slowness of American buyers to commit themselves. The familiar question of Government price regulation continues to restrain the market. Arrivals up to July 24 have been 2365 tons, with the quantity afloat on that day 3454 tons. The London quotation for spot Straits is unchanged from last week at £239 10s.

Lead.—Until Monday of this week the lead market had not recovered from its scare of last week, and the tendency was downward. The market reached a level of 10c., New York and St. Louis, on Monday, due to fairly liberal offerings from second hands and from consumers, with buyers assuming a safe attitude. Lead was obtainable practically all the week until yesterday at 10c., New York, at which some sales were made for August shipment. The trade is firm in the conviction that a large amount of lead will be wanted for war and other purposes. Due to the fact that the offerings referred to were either withdrawn or sold, the market stiffened yesterday, so that it was difficult to obtain lead under 11c. for any position. Small quantities, however, were sold here and there yesterday at 10.25c., New York and St. Louis, with 100 tons going as low as 10c. The leading producer continues to maintain its quota-

tion at 11c., New York, and an advance in the outside market is looked for in the coming week.

Spelter.—Because of a realization on the part of some that spelter is cheap at prevailing levels, there has been more inquiry than in the recent past. The market is a little stronger, but actual new business has been light, especially for prompt or early delivery. There have been sales of small lots of 50 to 100 tons each for future delivery, for which anywhere from 8.50c. to 8.62½c., St. Louis, or 8.75c. to 8.87½c., New York, has been realized. There have been a few sales as low as 8.37½c., St. Louis, or 8.62½c., New York. The quotation yesterday was generally recognized as 8.50c., St. Louis, or 8.75c., New York, for prime Western spelter for early delivery, with future delivery at almost the same level. The question of the Government's needs and what it will pay is expected now to be cleared up in a few days—a much desired settlement. It is possible that an order for the remainder of the year may soon be settled, and this will tend to stabilize the entire market. It is reported to-day that the Government has negotiated a purchase of 25,000 tons of prime Western at 8.75c. per lb., St. Louis, for delivery over the remainder of the year. No confirmation is obtainable.

Antimony.—Yesterday and Monday, sales of 25 tons each day of Chinese and Japanese antimony under the hammer on the Metal Exchange were made at 13.37½c. per lb. in bond, which is about 14.50c. to 14.75c., duty paid, New York. Demand is slack, and the market is quiet and nominal at about 15c., duty paid, for those grades.

Aluminum.—In the absence of demand and because of offerings, the market is lower at 53c. to 55c., New York, for No. 1 virgin aluminum, 98 to 99 per cent pure.

Old Metals.—The market is very unsettled. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible.....	27.00 to 28.00
Copper, heavy and wire	26.00 to 27.00
Copper, light and bottoms.....	24.00 to 24.50
Brass, heavy	18.00 to 19.00
Brass, light	13.50 to 13.75
Heavy machine composition.....	25.00 to 25.50
No. 1 yellow rod brass turnings.....	17.50
No. 1 red brass or composition turnings.....	20.00 to 21.00
Lead, heavy	9.00 to 9.25
Lead, tea	7.75
Zinc	6.75

Chicago

CHICAGO, July 23.—Copper quotations are nominal. Reflecting conditions which prevail in the East, they are much lower, but it is not easy to find metal at the lower prices. Complaint is made that purchases cannot be made at levels quoted by some big Eastern sellers. Tin is in fair demand and a little higher. Spelter continues soft, although it is a trifle more active. No interest is shown in lead, and antimony is unchanged. We quote as follows: Casting copper, 26c.; Lake, 29c.; electrolytic, 27c.; tin, carloads, 63c.; small lots, 65c. to 66c.; lead, 10c. to 10.25c.; spelter, 8.50c.; sheet zinc, 19c.; Oriental antimony, 18c. to 20c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c.; copper clips, 20.50c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 8c.; zinc, 6c.; pewter, No. 1, 35c.; tin foil, 40c.; block tin, 45c.

St. Louis

JULY 23.—Non-ferrous metals have been quiet during the week just passed, with the closing prices to-day on car load lots as follows: Lead, 9.87½c. to 10c.; spelter, 8.25c. to 8.50c. In less than car load lots quotations were as follows: Lead, 11.50c.; spelter, 9.75c.; tin, 63c.; Lake copper, 31c.; electrolytic copper, 30.50c.; Asiatic antimony, 19c. In the Joplin district producers were paid practically the same prices as a week ago, the basis range for zinc blende being \$65 to \$75 per ton for 60 per cent metal, with the average for the district at \$70 per ton. Many of the sheet ground mines have shut down, but the Oklahoma district production is keeping up the supplies for a time. If more sheet ground mines close, however, it is believed that the supply of ore will run short enough to start

sharper bidding for the output. Calamine ranged from \$35 to \$42 per ton, basis of 40 per cent metal, with the average for the week for the district \$40 per ton. Lead was steady at \$115 per ton, basis of 80 per cent metal, and the average for the district for the week was \$115 per ton. On miscellaneous scrap metals we quote as follows: Light brass, 12c.; heavy yellow brass, 15c.; heavy red brass and light copper, 20c.; heavy copper and copper wire, 23.50c.; lead, 7c.; zinc, 7c.; tea lead, 6c.; pewter, 25c.; tin foil, 42c.

French Method of Tinning Cast-Iron Vessels

A method of tinning cast-iron pots and other utensils for domestic use is offered from a French source, *La Chronique Industrielle*. For household utensils only pure tin should be employed and not tin and lead, as the latter forms poisonous salts with the acids of food products. To insure adhesion of the tin the iron should be treated to remove the carbon or otherwise it should be polished by mechanical means. To remove the carbon, the iron is coated with a layer of oxide of iron or manganese or else the iron is enclosed in a box with the oxide and maintained at a high temperature to burn out the carbon. After four to six hours the iron is sufficiently decarbonized to permit the adhesion of the tin. After this procedure the iron is cleaned with dilute sulphuric acid to which is added a small amount of blue vitriol. The iron is then immersed in molten tin; or, if the interior of a vessel is to be coated, molten tin with a little sal-ammoniac is vigorously rubbed over the surface. It is preferable to heat the iron before applying the tin. This must be done with care otherwise the surface will be oxidized and impair the adhesion of the tin.

A new process for the fixation of atmospheric nitrogen which produces sodium cyanide and on further treatment ammonia, has been put forward by Prof. John E. Bucher. Coke, sodium carbonate and iron borings are raised to a red heat in an atmosphere of nitrogen or producer gas, forming sodium cyanide. By boiling this with caustic soda, ammonia is readily obtained. While this process is only in the experimental stage now, it is understood that an operating plant is being erected and that a nitrogenous product of some character will be placed on the market soon.

The Sai-nei iron mines in Corea, owned by the Japanese Government, produced 73,611 tons of ore in the first nine months of 1916. It was shipped to the Government blast-furnace plant at Wakamatsu, Japan. The Mitsubishi Co., another Japanese company, owns mines at the same place, but no ore is yet being mined. The company is reported erecting a furnace at Kengi-ho in the same locality.

The polishers at the Remington Bridgeport Works, Bridgeport, Conn., are on strike as a protest against the employment of women at a lower wage rate than paid the men. The management has refused to see representatives of the Polishers' Union and the men are firm in their position that they will not return to work until the differences are adjusted.

The Oliver Chilled Plow Co., South Bend, Ind., announces a plan of pensioning employees who have been with the company 20 years or more. Those reaching the age of seventy will be retired and those 65 years of age or more may retire on pension, if circumstances warrant. No pension is to be more than \$100 or less than \$12 a month.

The Sterling Products Co., Inc., of Chicago, distributor of high-speed drills and hack saw blades, has opened a branch office in St. Louis at 938 Syndicate Trust Building, in charge of R. O. McGraw.

The offices of Ernest S. Cox, manufacturers' direct representative for mill supply and hardware specialties, have been removed from 326-328 Diamond Street, to 1322 Oliver Building, Pittsburgh.

Pittsburgh Expects No Labor Shortage

PITTSBURGH, July 25—(By Wire).—Prominent steel interests in the Pittsburgh district say they do not expect a very large shortage in men by reason of the draft. They are relying upon the Government's industrial exemption system to protect the steel interests against a shortage in labor. The Government at Washington recognizes fully the pressing needs of a full output of steel at all the plants in order that Government work may be turned out promptly, and nothing will be done to cut down output that can possibly be avoided.

The Phillips Sheet & Tin Plate Co. is installing extensive coal handling equipment at its Clarksburg, W. Va., plant.

Asbestos-Cement Sheets as a Substitute for Corrugated Iron

An asbestos cement roofing material which is offered as a satisfactory substitute for corrugated iron, is being made now in Great Britain. In the course of the last 12 months a factory has been built and equipped by the British Everite & Asbestilite Works (Limited) at Farnsworth and Bold, near Widnes, in Lancashire, for the manufacture of this product. It is made as follows:

After being finely ground and freed from extraneous matter the asbestos, which acts as a reinforcing agent, is mixed with Portland cement in the proportion of about 1 to 6, and made into a kind of paste with water. This paste is then taken to a machine of the paper-making type where, on a large revolving drum, it is formed into sheets or felts. After being trimmed to size these sheets, if they are to be made into corrugated roofing, next have the corrugations impressed on them, the important condition of this operation being to insure that the tops of the corrugations are as strong as other parts of the sheets. Finally the sheets are subjected to a seasoning process. The corrugations are made to the 3-in. pitch which is usual with corrugated iron sheeting, not to the 2½-in. foreign pitch, and they can therefore be readily used to repair roofs composed of corrugated iron sheets.

One of the chief advantages claimed is durability and resistance to climatic conditions, especially to an acid-laden atmosphere, which rapidly destroys corrugated iron. The sheets are also fire-proof and poor conductors of heat. The factory is well situated as regards supply of water, of which large quantities are required. The machinery is driven by electricity, current being obtained by means of a 200-h.p. National gas engine, and the power house is designed so that additional sets can be installed as demand develops.

Ready to Start New Plant

The Valley Mold & Iron Co., Sharpsville, Pa., expects to start this week its new plant at West Middlesex, Pa., for making ingot molds, which has been under erection for some months. The company will secure its entire supply of Bessemer iron for this new plant from E. W. Mudge & Co. of Pittsburgh, who will furnish it from their Ella blast furnace at West Middlesex, giving the concern the entire output of Bessemer iron from this furnace, about 400 tons per day, with the exception of the Sunday metal. The iron will be furnished on a sliding scale basis. The Valley Mold & Iron Co., when this new plant is in full operation, will have a capacity for turning out close to 1500 tons of ingot molds per day.

E. E. Marshall, Philadelphia, associated with the Newport Iron Co., will place the Lochiel blast furnace at Harrisburg, Pa., in operation on Aug. 1. The plant has been undergoing extensive repairs and improvements. The furnace has been idle for about 15 years. Mr. Marshall is president of the American Manganese Mfg. Co.

The new plate mill of the Donner Steel Co., at Buffalo, has been completed and will be placed in operation this week.

PERSONAL

Chairman E. H. Gary of the United States Steel Corporation will spend several weeks in Alaska, leaving New York Aug. 2.

John A. Topping, New York, chairman Republic Iron & Steel Co., leaves next week for Canada and will be absent through the month of August.

J. A. Flood, formerly connected with the Venango Mfg. Co., Franklin, Pa., has resigned to become general manager of the Producers' Supply Co., that city, which recently built a new gray iron foundry with a daily capacity of 25 tons.

George Ramsey, recently identified with the Babcock-Wilcox Co., at Barberton, Ohio, and the General Fireproofing Co., at Youngstown, Ohio, has been appointed a captain in the Ordnance Department of the United States Army, with headquarters at Washington.

Howard Britton, Jr., formerly in the New York sales offices of Manning, Maxwell & Moore, is now located in the Pittsburgh offices of that concern in the Park Building, handling brass goods in the Pittsburgh district, and the Central West, also as far East as Altoona, Pa. Mr. Britton will handle the brass goods made by the Ashcroft Mfg. Co., the Consolidated Safety Valve Co., the Hayden & Derby Mfg. Co., and the Hancock Inspirator Co., these four concerns being owned and operated by Manning, Maxwell & Moore.

N. P. Hyndman, general sales agent for the Washington Coal & Coke Co., Dawson, Pa., is in California on a pleasure trip, and will return about Aug. 1.

Tom J. Muir, of the sales department of the Morgan Engineering Co., Alliance, Ohio, is temporarily in charge of the company's New York office, 120 Broadway, until a successor to E. J. Parker is appointed. Mr. Parker recently joined the staff of the Vulcan Steel Products Co., New York.

R. A. Byrns, manager of the New York office of the Northern Engineering Works, Detroit, has joined his regiment of the National Guard.

E. F. Entswile, mechanical engineer at the Bethlehem Steel Co., Steelton, Pa., has been promoted to general superintendent of the Donaghmore plant at Lebanon. He will be succeeded by Frank E. Howells, who is now assistant mechanical engineer at the Steelton plant. Mr. Entswile succeeds W. L. Wolf, who has resigned to accept another position. He went to Steelton from the plant at Sparrows Point about 15 months ago.

Edgar N. Dollin, organizer and president of the Acme Die-Casting Corporation, Brooklyn, N. Y., has sold his holdings in that company and is retiring from active management. Mr. Dollin was formerly secretary of the Doehler Die-Casting Co., and president of the Kalak Water Co. He is planning a short vacation but expects to be back in business in the near future.

Harry E. Harris, president Harris Engineering Co., Bridgeport, Conn.; John H. Barr, consulting engineer Remington Typewriter Co., New York, and William A. Viall, Brown & Sharpe Mfg. Co., Providence, R. I., have been appointed a committee to co-operate with the National Bureau of Standards in the making of gages for munitions manufacture. Mr. Barr has been named chairman of the committee.

James N. Hunter, Pottsville, Pa., has been appointed an inspector of the Labor and Industry Department of Pennsylvania. Ernest C. Smith, Turtle Creek, has also been appointed to a similar position.

John K. Miller, Jr., associated with E. J. Lavino & Co., Bullitt Building, Philadelphia, has resigned to join the United States Signal Corps.

S. M. Tolbert, of Chattanooga, Tenn., has been appointed general manager of the Sewanee Fuel & Iron Co., succeeding John E. Patton.

Fred L. Watson, who held the position of treasurer of the American Steel & Wire Co. from 1897 to 1915, has removed his headquarters from Chicago to New

York, where he has become assistant to the president of the Federal Export Corporation and treasurer of the Commercial Iron & Steel Corporation. He has been closely identified with the steel and wire interests of the United States since the first Baker patent flat barbed wire was produced commercially in 1880. He was actively engaged in all the consolidations of the Columbia Wire Co., the American Steel & Wire Co. of Illinois, and the final incorporation of that organization in the United States Steel Corporation. In his present connection, Mr. Watson will direct the financial affairs pertaining to the large contracts for American steel products which the Federal Export Corporation has with its selling houses abroad.

Ritaro Hirota, Tokyo, Japan, lecturer on mining machinery, Imperial University, spent several days in Milwaukee last week on a tour of the United States in the interests of the Japanese Government.

H. A. Wagner, president Wisconsin Bridge & Iron Co., North Milwaukee, Wis., entertained a party of 60 in the dining room of the office building in honor of the employees of the company who have enlisted in the military service and are about to leave for the mobilization camp. Each of the soldiers was presented a wrist watch.

James W. Lyons, former president of the Lyons Boiler Works, DePere, Wis., and later associated with the Lyons-Atlas Co., Indianapolis, has been elected vice-president and general manager of the Whitman-Bull Tractor Co., St. Louis.

Carleton R. Dodge, recently of C. R. Dodge & Co., New York, has been appointed assistant sales manager of the Lakewood Engineering Co., Cleveland, in charge of the Philadelphia territory. The offices are in the Widener Building.

Aall & Co., of Tokyo, the Japanese agents for the American Steel Export Co., have added B. Orum Andresen to their engineering staff. Mr. Andresen, prior to leaving for Japan, spent several days acquainting himself with the organization and the facilities which the American Steel Export Co. have for export engineering and contracting.

R. J. Doty, who for the last three and one-half years has been in charge of the steel foundry of Isaac G. Johnson & Co., Spuyten Duyvil, N. Y., has severed his connection with that company to become associated with the Sivy Steel Casting Co., Milwaukee, Wis., which is enlarging its plant and installing an additional 3-ton electric furnace.

Harry A. Reichenbach, who has been efficiency engineer for the Bethlehem Steel Corporation, has resigned to accept a similar position with the Alpha Portland Cement Co., Easton, Pa.

B. L. Yepsen has been elected second vice-president and general manager of sales of the National Fireproofing Co., Pittsburgh.

Sharon Steel Hoop Co. Improvements

PITTSBURGH, July 25—(By Wire).—The Sharon Steel Hoop Co., Sharon, Pa., which took over some months ago the plant of the Youngstown Iron & Steel Co., East Youngstown, Ohio, will make a number of improvements. A new pit furnace will be built. Additions will also be made to the finishing mills and electric motive power will be installed to replace steam in some departments.

The Machine Tool & Supply Co., Davenport, Iowa, distributor of machine tools and machine shop equipment, has removed into a new three-story building which affords largely increased facilities. The company was organized last October.

The Tock Screw Machine Products Corporation, which was recently incorporated, has established an office at 199-203 Eighth Street, Long Island City, N. Y., and is building a factory building, 50 x 100 ft., one story, at that address.

ARTIFICIAL FUELS FROM DUST

British Suggestions to Conserve Coal and Coke Ashes and Fines

Artificial coals made from coal or coke ashes and dusts was discussed recently at a meeting of the Society of Architects (British) by R. Goulburn Lovell, in a paper, "Coal Briquetted from Ashes or Dusts." He exhibited five samples of such coals which he described as having been respectively briquetted from (1) coal dust alone, (2) from coke dust alone, (3) from destructor ash alone, (4) from destructor ash and coal dust, and (5) from clinker, bar ash and sawdust.

Dealing with their qualities, he said it would be seen in the fire that the better grades burnt like Nature's coal, the lower grades like coke; they all flared, coked and became incandescent. Further, these artificial coals would be found to be lasting in the same way as a good artificial stone was more lasting than most stones made by Nature. The machinery and plant required practically existed in all industrial centers. The essentials were crushers or breakers, screens, drying tables, mixers and moulds such as cast-away pails, baths, etc. For the coking process either ovens or boilers could be used, the main object at the present time being to utilize any existing plant with unskilled labor.

Cost of Production

The cost depended mainly upon the value put upon the bases, the cost of the matrices, such as glucose, pitch and other bitumens, and the cost of the chalk or other calcium carbonates. For instance, the destructor ash and clinker at Eastbourne was valued at 6s. per ton, whereas at Birmingham an allowance was made of 2s. 6d. per ton. The coke breeze in London was valued at 6s. per ton, and in Birmingham at 1s. The price of hard pitch was quoted 38s. a ton at Eastbourne, 22s. at London, and 18s. at Birmingham. On the other hand, the price of chalk was 3s. 6d. a ton at Eastbourne, 6s. at London, and 16s. at Birmingham. Speaking generally, the cost of the materials of these seven typical examples would be roughly:

Calorific Values in B.t.u.	Samples	Shillings per Ton
7,500	No. 1 Eastbourne destructor ash.....	11.0
8,040	No. 2 Maples destructor and coal dust...	4.6
10,320	No. 3 Maples destructor and sawdust...	9.0
10,540	No. 4 Birmingham destructor and coal dust.....	8.0
11,840	No. 5 Birmingham coke dust.....	7.0
12,600	No. 6 London coke dust.....	10.0
12,820	No. 7 Staffordshire coal dust.....	10.0

The cost of the labor and establishment charges in the British Isles would not be more than 5s. a ton.

Discussion

In a discussion of the paper, H. W. Bowden, chief electrical engineer to the Poplar Borough Council, said that the removal of ashes and clinker was a very serious item. He had 150 tons from his boilers to dispose of every week, and had to pay 3s. 6d. to 4s. per ton to have them removed. As to what happened to the ashes after the artificial fuel was burned, in his case the riddlings that went through the chain grates contained a considerable amount of useful coal, which went away with the ashes. He had tested this and proved it to contain about 4000 B.t.u. If that were used under the author's method what increase would he expect in its value? He also had some 30 tons per day of destructor clinker, in which he did not think there was much calorific value. Did the author think this material likely to be of value in his process? What would be the cost of a plant dealing with about 40 tons per day?

Mr. Lovell said it was only the ash from destructor works that was used in the process. The clinker would be useful for road-making. He believed that he could improve the ash from the Poplar destructor works from 4000 to 10,000 B.t.u. As to cost of plant, he proposed that where the process was adopted old plants at present lying idle all over the country should be used. The residue from burning this artificial fuel could be used again in the same way. The great point of the process

was proper mixing and for that purpose a concrete mixer was to be preferred. He had received an estimate from a responsible quarter to make the fuel at 6s. per ton, apart from the cost of the materials. Calcium carbonate was an essential of the binding material and with it was used any form of bitumen or any form of sugar waste. With bar ash and clinker added to sawdust he had produced a fuel having 11,000 B.t.u. and with Gas Light and Coke Company's coke dust alone, plus the binder, a fuel containing 13,000 B.t.u. The binder in the latter case was pitch, but he was not dependent upon that. Equally good results had been obtained with sugar waste.

W. R. Cooper said it must not be assumed that slack and coke breeze were not already used for steam-raising purposes. As a matter of fact they were. As to coal dust, he was not so sure that there was so much value in that as the author seemed to imply. It was very often found to contain a high percentage of ash which was very much against it for general use. There was a popular idea that there was a great deal of waste coal of a valuable character to be found at the pits, but that was not the case.

Another speaker mentioned that the author had assumed the value of slack at 10s. per ton, whereas in London at the present time it could not be purchased under 18s., and that would alter the value at which it was suggested the fuel could be sold.

Mr. Lovell said he had been offered slack in Birmingham recently at 8s. per ton, and, naturally, it varied throughout the country. In any case this should not increase the cost to more than 20s., so that the fuel should be on sale at 25s. per ton.

OBITUARY

George E. Youle, western manager for the S. A. Woods Machine Co., Boston, died at his home in Seattle, July 11. Mr. Youle was a pioneer woodworking machinery man. Born at Saybrook, Ill., 54 years ago, he went to the Pacific Coast in 1884, where he engaged in selling sawmill and shingle-mill machinery. He had been connected with the Woods Machine Co. for more than 20 years, of which the past nine years had been spent in Seattle.

Frederick Burr Hawley, president Spring Perch Co., Bridgeport, Conn., died July 19 at his home in that city of old age. He was born in Bridgeport, Oct. 28, 1838, and succeeded his father as head of the Spring Perch Co.

H. R. Fothergill, master mechanic of the Carbon Steel Co., Pittsburgh, died at his home in that city on Saturday, July 21, of pneumonia.

Phillips Sheet & Tin Plate Co. Additions

The Phillips Sheet & Tin Plate Co. has recently finished, and is still making some large additions to its plants at Weirton, W. Va. The company has lately finished building a 20-in. roughing mill, which serves a 16-in. semi-continuous mill on which it will roll bands up to 16 in. wide. The company is also building a 10-in. mill on which it will roll bands from 1 in. to 5 in. wide, but does not expect to complete the building of this mill before December. To its cold rolled strip steel department the company is adding 22 12-in. and 16-in. mills, which will be completed early in September. These will double the output of the company in the manufacture of cold rolled strip steel, which will be from 3000 to 6000 tons per month, in sizes from ½ in. wide up to 18 in. wide. The Phillips Sheet & Tin Plate Co. owns three tin plate mills, one at Clarksburg, having 12 hot mills, one at Weirton with 24 mills, and another at Steubenville with 12 mills, giving the concern a total of 48 hot tin mills. When all its new cold rolled strip mills at Weirton are finished, it will be the largest single maker of cold rolled strip steel, and is also the largest independent maker of tin plate.

Our Steel Industry's Manganese Supplies

Mining Engineers Discuss American and Brazilian Ores—Metallurgy of Manganese in Steel—Substitutes and the Present Supply

ONE of the most valuable meetings of the local section of the American Institute of Mining Engineers was held Friday evening, July 20, in the rooms of the Machinery Club, New York. The subject under discussion was the supplies of manganese and chromium for the steel industry of the United States.

The Manganese Necessary

The subject was introduced by D. F. Hewett, of the United States Geological Survey, Washington, who was present especially to review the situation regarding the mining of manganese ore in the United States up to the present time. In opening Mr. Hewett said that the alloy committee of the Council of National Defense had advised that enough manganese be aimed at for the production in 1917 of 50,000,000 tons of steel. That would mean 400,000 tons of ferromanganese and 200,000 tons of spiegeleisen. To make 400,000 tons of ferromanganese would call for 900,000 tons of manganese ore and to produce the 200,000 tons of spiegeleisen not less than 500,000 to 600,000 tons of manganiferous iron ores would be required.

Discussing the price of manganese ore, the speaker stated that before the war this had been influenced by quotations at Antwerp and in England and also by those of the Carnegie Steel Company in this country. Before the war 40 to 50 per cent manganese ore ranged about 22c. per unit, or \$9 per ton. At the present price it is \$1 to \$1.10 per unit, or about \$48 per ton, over five times that before the war.

Ore Supplies in the United States

Discussing the question of supplies in the United States from its own mines, Mr. Hewett exhibited slides showing data up to July 1, 1917. He estimates the output of the United States for 1917 at 79,600 gross tons, of which Montana is credited with 38,500 tons, Virginia, 15,430 tons; Arkansas, 9500 tons; California, 7300 tons. In 1916 the total production was only 28,345 tons, of which Montana furnished 14,206 tons; Virginia, 3705 tons; Arkansas, 4361 tons, and California, 3012 tons. Not only is the rate of production in the United States this year about three times that of 1916, but certain States have increased their output to three to five times that of 1916.

An interesting statement was that in 1913 there were only two shippers in the United States of manganese ore averaging about 40 per cent manganese, whereas in 1916 this number had grown to 53. The marked increase in the domestic production of high-grade manganese ore is also paralleled by the increased output of manganiferous iron ores ranging from 15 to 40 per cent manganese. The output of such ores in 1917 will probably be about 475,000 tons.

Mr. Hewett discussed in an interesting way the genesis of the formation of manganese ore, stating that it is a product produced by secondary enrichment. Practically no large deposits are known in the United States and none of those in the world are more than 600 ft. below the surface of the earth, while most that are producing ore to-day are yielding at a depth of not over 200 ft. He spoke of the rather unusual achievements of the Noble Electric Steel Co. at Heroult, Cal., in successfully producing ferromanganese from high silica ores in an electric furnace, something ordinarily considered impossible in a blast furnace.

Mr. Hewett's conclusions were that it is impossible for the United States to supply the steel industry with enough manganese if the present practice of using manganese remains as it is. If it were possible, he said, to use the manganese in manganiferous iron ores, there would be enough manganese in these ores in the

United States, if converted into such alloys as were possible, to last three years.

The Geological Survey at present has eight men in field work on this subject and all mining projects are being carefully investigated. Mr. Hewett alluded to a singular fact in the history of this development, namely, that of the ore mined between 1912 and 1916, the source of 75 per cent changed ownership many times, in some cases over five. He said that it had been suggested also by Mr. Newton of the experiment station of the Minnesota School of Mines as another line of attack that some method might be possible of conserving the manganese in the bath of the steel furnace so that less manganese would be necessary as an addition in finishing the steel. Another important consideration would be the perfection of a method of making ferro-manganese out of manganese ore high in silica.

Brazil as a Source of Ore

Brazil as a source of high-grade manganese ore was interestingly discussed by Kirby Thomas, mining engineer, New York, who has recently made an investigation in that field. After briefly describing the extent of the deposits and showing how shipments had grown from 1300 tons in 1894 to over 350,000 tons in 1915, he made the important statement that there is enough ore of the best grade in that country, not only for war needs, but to last our steel industry for 25 and possibly 50 years.

Discussing the factors controlling this supply, Mr. Thomas said that first the question of railroad transportation is important. There is only one railroad, which is owned by the government. The equipment is poor, but the capacity for handling possibly 500,000 tons a year might be increased to 650,000 or 700,000 tons. The second factor is the handling of the ore at the harbor of Rio de Janeiro. Mr. Thomas stated that this port is not equipped to handle bulk shipments like manganese ore; that the ore had to be transferred from the railroad to an island at the harbor and from this island again by means of lighters to the boats bringing it to this country. A rather serious phase of this situation is that no changes are being made. Another important fact is that port charges have nearly doubled until at present they are \$2.50 to \$3 per ton. Railroad freight charges on this ore have increased from \$1.50 to \$2.50 and \$3 a ton.

Ore Freight Charges

An idea of other advances bearing on this subject was conveyed by the statement that, whereas ocean freight before the war to Europe and the United States for carrying this ore was \$3.50 to \$3.75 per ton, it increased after the war started to \$7.50, then to \$10 and \$15, and within the last two or three months to \$20. Mr. Thomas stated that the boats that are used ordinarily can take only a small amount of ore and that many companies in this country are now using their own boats to transfer the material, which ordinarily takes 19 days from Brazil to this country. He believed the situation to be increasingly critical in that the shipping situation is growing worse and also because many vessel owners are preferring to take other freight than manganese ore except for ballast.

The suggestion has been made that the Brazilian Government use a large number of enemy boats at present in its possession, aggregating some 600,000 tons of shipping, as a means of transferring this ore to the United States. It has also been suggested that the question of smelting Brazilian ores in Brazil itself by an electric process be carefully considered. Power there is reasonable, power near the mines could be

obtained and water power in the interior is abundant. The production of ferromanganese in Brazil in blast furnaces is prevented by the fact that only charcoal is available as a fuel.

Brazilian Iron-Ore Deposits

In concluding his remarks, Mr. Thomas called attention to the wonderful deposits of iron ore in Brazil, deposits which exceed in extent and in quality any in the world. He predicted that the present owners of these mines, American, British and local capitalists, will some day in the not distant future develop these mines so that they would be a most important source of supply. An important consideration in this connection is the fact that some of the large manganese mines are located not far from this iron ore, so that the predicted developments could make the manganese ore still more easily available.

Manganese in Central America

Discussing deposits of manganese ore in Costa Rica, Mr. Thomas stated that they were very promising on the west coast, but that while shipments already made had not been of a satisfactory grade, he had been assured that good material exists in reasonably extensive quantities in that district. One disadvantage is that the ore had to be loaded on lighters and carried to vessels some distance from the shore. Other deposits in that country are under investigation and will probably turn out to be important. The Panama deposits, he said, are also promising.

The Metallurgy of Ferromanganese

The metallurgy of the production of ferromanganese was lucidly presented by J. E. Johnson, Jr., consulting engineer, New York. It is an acknowledged fact, he stated, that more heat is necessary in the blast furnace to smelt manganese ore than iron ore, as much as two times and possibly three times more. More carbon is necessary, partly because of the fact that carbon has a greater affinity for manganese than manganese has for iron. As a result, in making both spiegeleisen and ferromanganese, the carbon absorbed and existing as a constituent of these products is greater than in the case of making pig iron. In spiegeleisen the percentage of carbon is around 5 per cent, and in ferromanganese around 6 per cent. It is practically impossible to use spiegeleisen as a substitute for ferromanganese in making certain carbon steels relatively low in carbon, because in adding the spiegeleisen, so great a percentage by weight of carbon is added at the same time. Because of the bulk necessary to obtain the desired amount of manganese, the spiegeleisen must be added hot in most cases, and while this practice is entirely feasible in rail making, present steel plants are not laid out to do this generally. It is an impossibility to meet certain specifications, when using spiegeleisen, which demand certain carbon and manganese percentages.

The Role of Manganese

The role of manganese is largely as a deoxidizer, the speaker said. Experiments to use ferrosilicon as a substitute have not been very successful. The silicon appears to be less efficient as a deoxidizer, and it had been his experience that oxygen remains in metal when 2 to 3 per cent of silicon is present, whereas it would immediately vanish in the presence of 1 per cent of manganese. Aluminum as a deoxidizer could not be used in large quantities. Another important consideration is the fact that manganese seems to affect the rolling properties of the steel. Mr. Johnson did not believe that any adequate substitute was possible.

In the metallurgy of ferromanganese the question of silica in the ore is an important one. Manganese is more active than iron. Under certain temperature conditions, the manganese is easily lost, whereas under other conditions of heat or cold, other serious results occur. It had been stated at one time that it required 120 units of manganese to make 80 per cent ferromanganese or a loss of 30 per cent, although Mr. Johnson stated that he understood that this loss had in some practice been reduced to 6 per cent.

Discussing the use of charcoal as a fuel in making

ferromanganese, he stated that theoretically it was not desirable, but from his own experience in smelting manganiferous ores from the Cuyuna range, he had been able to make spiegeleisen with a low fuel consumption, much to his surprise.

Importance of Manganese in Steel

Bradley Stoughton, secretary American Institute of Mining Engineers, discussed the effect of manganese on steel. As an explanation of the apparent fact that a substitute cannot be found for manganese, the speaker said that manganese takes oxygen completely out of the steel, whereas silicon often remains in the steel as silica and aluminum as aluminum oxide or alumina. Manganese not only takes the oxygen out, but it also removes the silica as a silicate. Oxide of manganese remaining possibly in the steel is also not as harmful. An important fact is the neutralization of sulphur by manganese, a very necessary role.

Much has been said concerning German substitutes for manganese, but Mr. Stoughton did not believe these statements. Reports coming to him led him to believe that German steel as at present made is low in manganese and poor in quality. If the German situation is bad, said Mr. Stoughton, our situation would be still worse under similar circumstances.

Possible Stoppage of Our Steel Industry

It is not perhaps generally known, but he understood it to be a fact that at one time only a few pounds of dynamite stood between the United States steel industry and almost complete paralysis. The railroad bringing the ore from the mines in Brazil crosses several large bridges and on representations from this Government these are now being carefully guarded.

Mr. Stoughton believed that there might be many ways of solving this important question. The possibility of the electric production of pure manganese from manganese dissolved in iron salts had been suggested, the manganese going to the cathode. Possibly pure manganese could be formed from low-grade ores existing in this country in large quantities. He believed the real problem is a method of using these ores. He stated that any suggestions that members of the institute might have, no matter of what nature, if forwarded to him would be brought to the attention of the authorities at Washington and carefully investigated.

Henry D. Hibbard, consulting engineer, Plainfield, N. J., in the general discussion stated that many years ago, at a suggestion from P. H. Dudley of the New York Central Railroad he had attempted to replace manganese in steel by silicon. In 1885 he made a steel of about 0.30 per cent carbon, containing 0.25 to 0.30 per cent silicon. The addition of the silicon, of course, completely killed the steel, but when re-heated in the shape of ingots or rolled it broke up like so much glass.

Control of Manganese Loss in Steel Bath

Mr. Hewett again brought up the question of the control of manganese in the steel bath, saying that it had been suggested to him that this could be done before the regular additions of ferromanganese and that American practice differed from that of Germany and some other countries. In American steel making, he understood that the manganese in the bath towards the end of the heat was as low as 0.10 or less, whereas in Germany it was maintained as high as 0.40 or 0.50. He asked if the use of high manganese pig iron would not tend to maintain a higher percentage of manganese in the bath as suggested in the foregoing as well as prevent a certain amount of oxidation and therefore the necessity of using so much ferromanganese.

J. E. Johnson, Jr., said that for a long time it has been acknowledged that better steel is made from pig iron containing manganese than from pig iron containing none. He did not see how it was possible in present American practice to maintain the manganese at a high point near the end of the heat. In Bessemer practice the manganese is reduced to 0.10 before the carbon goes, but in open-hearth practice, it might be possible to keep up the manganese to some extent.

Henry D. Hibbard stated that in Swedish practice

pig iron, containing 3 to 4 per cent manganese, had been used in Bessemer practice so that the steel made contained enough manganese in it without any further addition to make good steel. This fact, he said, had really saved the life of the Bessemer process, which otherwise would have had to be abandoned because in England its use without the presence or the addition of manganese had had disastrous results.

Professor Rousch of Lehigh University, South Bethlehem, Pa., gave some interesting testimony regarding the sequence of the elimination of various elements in Swedish and American practice in both Bessemer and open-hearth steel making and also brought up the question of the use of a calcium-silicon-aluminum alloy. It had been advocated that this compound, when acting as a deoxidizer, at the same time formed a slag which removed itself easily from the steel.

Present Supply of Ferromanganese

Some facts as to the actual supply of ferromanganese for the steel industry of the United States at the present time were given by Edwin F. Cone, associate editor THE IRON AGE. It is a fair assumption, he said, that the output of steel in this country in 1917 will not exceed 45,000,000 tons. Assuming the average amount of ferromanganese necessary in making various grades of steel to be 17 lb. to the ton, and taking into account the fact that probably two-fifths of the Bessemer steel output can be satisfied entirely by the use of spiegel-eisen, the amount of ferromanganese necessary for the steel industry of the United States in 1917 would be about 316,000 gross tons, of which 10,000 tons is used by the iron foundries of the country.

The alloy committee of the Council of National Defense, in a recent canvass of the situation, has determined that the steel industry at present consumes 28,000 tons of ferromanganese per month. The question of the British supply had not been brought into the discussion, he said, but it is an important one. So far this year the domestic production of ferromanganese, according to the blast furnace returns of THE IRON AGE, has averaged 20,000 tons per month. This was increased to 21,000 tons in June, but it is hardly probable that this figure will be greatly exceeded. Therefore, to meet the calculations of the alloy committee nearly 8000 tons of alloy must be imported. Statistics so far this year indicate that this supplementary amount is not being supplied. While in 1916 British imports had averaged 7500 tons per month, and while for the first four months in 1917 the imports had only been about 6000 tons per month, in the last two months these had been under 3000 tons, with only slightly over 2000 tons in May. The sinking of over 2000 tons by submarines in the last six weeks was mentioned as showing the seriousness of the shipping situation.

Motor Truck Contracts Awarded

Contracts for 10,650 motor trucks, aggregating in value \$33,179,026, were placed last week by the War Department for the U. S. Army. The largest contract was for 3750 chassis, which was awarded to the Four-Wheel Drive Auto Co., Clintonville, Wis., at \$3,248 each, or a total of \$12,180,000. The contracts were as follows:

Four-Wheel Drive Auto Co., 3750 three-ton chassis, at \$3,248 each, to be delivered at the rate of 175 per month.

Packard Motor Car Co., 1500 three-ton chassis at \$3,197 each, delivery 500 per month, starting in October; 300 three-ton chassis, at \$2,804 each, delivery 100 in August and 200 in September.

Locomotive Co., 400 three-ton chassis at \$4,225 each, delivery 125 per month, beginning in October.

Nash Motors Co., 3000 one and a half-ton chassis, at \$2,805 each, delivery by July 1, 1918.

Garford Motor Truck Co., 900 one and a half-ton chassis at \$2,730 each, all delivered by the end of December.

Pierce-Arrow Motor Co., 800 one and a half-ton chassis at \$3,500 each.

NEW RAILROAD PROBLEMS

Storage and Transportation Matters Now Are Receiving Attention

WASHINGTON, July 24.—Storage and transportation problems are looming large as the result of rapid progress of manufacturers of munitions and the contractors engaged in building the thirty-two cantonments for the National Army and the National Guard. The Transportation Committee of the Council of National Defense, under the direction of the veteran traffic expert, Daniel Willard, president of the Baltimore & Ohio Railroad Co., is meeting the difficulties of the situation by standardizing the practice of all the railroads of the country in accordance with rules recently promulgated and expresses confidence in the ability of the carriers to do everything that is required of them. The storage problem, however, is a new one and is of vital concern, not only to the General Munitions Board, which is giving it continuous consideration, but also to every manufacturer in the country who is contributing in any way to the recruiting, arming, housing, and feeding of the American military and naval forces.

Allotments of war funds aggregating more than \$50,000,000 are soon to be expended for terminal storage areas at or near the seaboard. The equipment necessary to provide for each soldier going over seas is estimated at about 5½ tons, and the maximum of this storage load will be put upon the Nation before the end of the year. The Storage Committee of the Council of National Defense calculates that to provide the necessary facilities will require carefully designed and equipped areas, probably 2000 acres in extent. Adequate provision in this respect will permit the rapid unloading and loading of both freight cars and steamships and, obviously, the facilities must be made available before, and not after, deliveries in volume begin.

The General Munitions Board, which is studying the storage and transportation problem with great care, declares that the railroad situation is to-day the weakest link in the storage problem and that, unless we begin at once to take steps to safeguard the railroad situation, by next January we will have no storage problem because there will be nothing to store. Because of the car shortage manufacturers will be unable to secure raw materials or ship their finished products, facts which explain why the railroad factor is so strongly emphasized at this time.

Chairman Willard of the Transportation Committee is very optimistic that the railroads will be able to meet the demands upon them for the reason that all the rail systems of the country are now nationalized, the 693 companies operating in 48 States and controlling 263,000 miles of road responding admirably to central direction from the War Board, meeting every suggestion made by the Council of National Defense.

Mr. Willard calls upon shippers and business men in all lines to meet the new conditions in a philosophical spirit and not complain of reduction in facilities made necessary by the demands of the war. People, he says, become accustomed to receiving their freight at certain times and also to traveling on certain trains on every day schedule. The War Board has found it necessary to advocate to the railroad companies a careful examination of their schedules for the purpose of discovering if there are any passenger trains or trains of any other class being run that are not absolutely necessary, and if so that these trains be discontinued so that men and equipment may be made available for more important trains and the coal thus saved be used for other purposes.

The Dodge Mfg. Co., Mishawaka, Ind., has advanced wages 10 per cent, up to a maximum increase of 25 cents a day, or 2½ cents an hour. Piece work rates will carry a similar advance.

Forced to Order Guns in France

Years of Delay Result in Government Being
Compelled to Have Artillery Made Abroad
—War Department Explains the Situation

WASHINGTON, July 24.—Congressional indifference to the urgent representations of the most accomplished ordnance experts of the War Department extending over a period of more than 15 years has finally forced the American Government to the humiliating expedient of arming our forces in Europe with heavy artillery of French type manufactured in France in place of superior weapons designed by the Ordnance Bureau. This incident, taken in connection with the forced adoption of the British Enfield rifle in place of the superior Springfield, as heretofore described in THE IRON AGE, tells a story of stupidity, subservience to demagogues and almost criminal inattention to the needs of the nation on the part of both Senators and Representatives that will probably be one of the most salutary lessons of the war.

Soon after the close of the Spanish-American war, General Crozier, Chief of the Ordnance Bureau, drew the attention of the committees of Congress to the importance of providing for the manufacture of small arms and field artillery on a scale that would permit of very great expansion on short notice in the event that the United States should be threatened with a foreign war. He emphasized especially the necessity of having at hand and in perfect running order all the equipment necessary to produce rifles, pistols, field artillery and ammunition in great quantity. He also pointed out the inadequacy of the federal arsenal system to meet any such contingency, laying stress upon the fact that to meet the possible emergency of a suddenly precipitated war it would be necessary in time of peace to maintain a manufacturing establishment in a high state of efficiency capable of producing several thousand per cent more material than the Government would have any use for or could economically store.

The equipment of a reasonable number of private plants with special machinery and the necessary gages, dies, etc., to manufacture arms, artillery and ammunition to United States Army standards was the answer to the problem, in General Crozier's opinion, and in urging legislation to that end upon Congress, he drew attention to two salient facts: first, that the equipment could be provided for a very small sum, probably less than \$5,000,000, and kept in a state of efficiency by the placing of small so-called "educational orders" for the output thereof, and second, that a year or more would be required for the manufacture and installation of the necessary appliances. The repeated rejection of these suggestions has heretofore been described in connection with the abandonment of the Springfield rifle in favor of the Enfield. There were special reasons, however, why General Crozier was strongly insistent upon his recommendations with respect to facilities for the production of field artillery. In common with European ordnance experts he was convinced that the battles of the future would be fought with guns far exceeding in power and rapidity of fire and other elements of efficiency anything previously known to warfare.

The first month of the European war fully justified this view. The German army battered its way through Belgium with heavy and light artillery, the efficiency of which far surpassed anything known to military science a decade ago. The War Department quickly drew the attention of Congress to the first lessons of the war in Belgium and France, but it was not until a year ago that the military committees were aroused from their lethargy and induced to appropriate a small sum of money, approximately \$2,000,000, to enable the War Department to fit up a few private plants to assist in the work of arming such forces as the United States might be obliged to put in the field. When the money became available, however, every concern in the country capable of making gages, dies, and the necessary auto-

matics was swamped with European contracts and little or nothing could be done with the belated appropriation. The situation with respect to rifles was met, as has been told, by the purchase from the British Government of equipment for the manufacture of the Enfield at a cost of \$10,000,000, or more than twice the appropriation sought by the War Department four years ago.

The problem with respect to artillery was not susceptible of so easy a solution. The experts of the Ordnance Bureau had developed field guns in some respects superior to those of any other army, but while the capacity of American plants to produce ammunition for these guns was practically unlimited, there was no equipment in existence outside the arsenals to build the guns themselves. The War Department has therefore yielded reluctantly to absolute necessity and has decided to place orders in France for this artillery, chiefly 3 and 6-in. guns, which it is believed can be supplied almost as rapidly as our troops can be trained in the tactics employed in the Western theater of war. In explanation of its plans for the utilization of the surplus capacity of the French plants making artillery, the War Department has issued an official statement in part as follows:

It has long been known to those who have paid any attention to the efforts of our military authorities at preparation for war that the supply of field artillery has been wholly inadequate and has not been growing at a rate which seemed to be sufficient to accord with ordinary prudence. The shortage has been the subject of urgent presentation by the Chief of Ordnance for the past 15 years, but it has been only since the passage of the national defense act that measures have been authorized looking to anything like an immediate correction of the situation. Field guns can not be produced in a short time, and the plants for making the forgings and for afterwards machining and assembling the parts into finished guns require time for their erection and equipment.

In addition to the unsatisfactory stage of advancement of the pre-war program, the war itself has brought about an almost revolutionary increase in the use of artillery, both in the number of guns and in the amount of ammunition expended, so that on both accounts the officers of the War Department found themselves in greater straits for supplying the needs of the existing and prospective armies in field artillery than in regard to any other class of war material. The most obvious step, of course, was to give orders for manufacture such as to occupy the entire capacity of the country, particularly for the production of gun forgings, for which the capacity was the most limited and the requirements the most special, and in addition to provide for the greatest expansion of existing plants which the limits of justifiable dilution of their organizations rendered prudent. This had to be done in such manner as to interfere in the least possible degree with the orders of our allied nations for gun forgings, upon which they were and are still relying for the maintenance in artillery equipment of their armies in the field. After providing for the enlargement of existing plants, it was necessary to take measures for the construction of new plants, making use of the personnel of mechanical industries somewhat similar to that of gunmaking, under the organizations of officials and employees which were conducting them.

Under these circumstances a solution has been found which, fortunately, will go far toward meeting the situation. The gun factories of France have been highly developed, and in the matter of machining and assembling guns and carriages, as distinct from the manufacture of the steel out of which they are made, some surplus capacity has been attained which is now available for other than her own necessities. The ordnance department has taken advantage of this opening and has placed with the French Government orders for the manufacture of an initial supply of field pieces of the most necessary types, and of the most thoroughly demonstrated efficiency, namely, the 75 mm. gun and the 155 mm. howitzer (about 3 in. and 6 in., respectively, in caliber).

It is confidently believed that, as the result of this humiliating experience, Congress will be willing to make adequate provision for the preservation, after the war,

of the special equipment and productive capacity of a sufficient number of private plants to prevent a recurrence of the situation which the War Department has struggled in vain to meet since the United States became involved in the great conflict.

W. L. C.

REVISED STEEL EXPORT LIST

Additional Products for Which Licenses Must Be Secured

WASHINGTON, July 24.—With a view to meeting the requirements of exporters whose applications for licenses are reaching the Export Council in rapidly increasing numbers instructions have been given to arrange, as soon as possible, for the issuance of licenses at Philadelphia, Norfolk, Charleston, Savannah, Galveston and Los Angeles, in addition to the branch offices of the Department of Commerce at which applications have heretofore been received. It is anticipated that some applications filed at these ports may require reference to Washington, but as many as possible will be handled locally, and where questions arising under applications can be determined by communicating with Washington by telegraph, this will be done; otherwise the application will be referred to the headquarters here of the Export Council.

In view of the experience of the first fortnight under the embargo law, it is probable that it will be necessary to extend still further the list of ports at which licenses may be obtained and the council will give careful consideration to any representations of business men concerning the necessity for such extension.

Great confusion has arisen among exporters as the result of an official announcement made July 17, to the effect that many commodities had been added to the list of those specified in President Wilson's export control proclamation. In the statement referred to it was said that the Administrative Board of the Export Council had added the following articles:

Sulphur, saltpetre, nitrate of potash, benzol, rice, dried beans, peas, condensed milk, structural steel, shapes, and mild steel, including angles, tees, beams and channels; steel plates of ordinary tank quality, rolled-steel floor plates, rosin and turpentine, washing powder, hand-lantern oil, toluol, lubricating oil, steel plates, malt, tank plates and boiler plates, soap and soap products, and vegetable oils.

It is now officially stated by the Export Council that publication of the above list was unauthorized, and it is intimated that the incident was in some way responsible for the resignation of Dr. E. E. Pratt as chief of the Bureau of Foreign and Domestic Commerce. It is understood that the list was not intended to include any articles not already embraced in the President's proclamation, but merely to summarize a series of rulings of the Administrative Board holding that the articles enumerated in the supplemental list were embraced in the category of the President's proclamation. To-day the following revised list has been given out as representing iron and steel products for which export licenses are required:

Pig iron, steel billets, steel sheet bars, steel blooms, steel slabs, ship plates and structural shapes, iron plates, I-beams, mild steel plates, rolled steel plates, steel channels, steel angles, mild steel plates, ordinary tank quality; steel beams, steel plates, $\frac{1}{4}$ in. thick or heavier; steel sheets, $\frac{1}{4}$ in. thick or heavier are classified as steel plates; steel tees and zeos, structural steel shapes, boiler plates, tank plates, steel doors, steel car frames, steel towers, scrap iron and scrap steel, ferromanganese.

Since the resignation of Doctor Pratt, C. A. Richards of the executive staff of the council has been designated to act as secretary. Edward N. Hurley, formerly chairman of the Federal Trade Commission, has taken up his work as a member of the Export Council, representing the Department of Commerce. Vance McCormick,

chairman of the Democratic National Committee in the last campaign, who represents the State Department on the Council, has been chosen as chairman. It was originally announced that Mr. Hurley would serve as chairman, and it is surmised that the office may rotate after the manner followed by the Federal Trade Commission.

Copper Tubes for Airplanes

British aircraft makers have been experiencing difficulties in obtaining supplies of copper tubing. An investigation has shown, says the *London Times*, that the causes are the great variety of sizes called for and the fact that tube makers received orders very irregularly and for small quantities. The specification committee of the Air Board has decided that in future copper tube for aircraft shall be specified in terms of external diameter and the legal standard wire gage. So far as possible, tubes of 20-gage (0.036 in.) will be used to the exclusion of other thicknesses, but where for special considerations it is desirable to use other thicknesses the choice will be restricted, so far as it can be, to gages 16, 18 and 22. The last, being difficult to manufacture, will be avoided so far as possible. A new Air Board specification for copper tube is to be issued, giving as an appendix a list of sizes and gages which the Air Board regard as standard. Beginning with $\frac{3}{16}$ in. the 20-gage tubes will increase by sixteenths of an inch up to $\frac{1}{2}$ in., and then by eighths of an inch up to $1\frac{1}{4}$ in., with a 2-in. size. The 18-gage will increase by increments of $\frac{1}{4}$ in. from 1 in. to 2 in.; the 16-gage by increments of $\frac{1}{8}$ in. up to 1 in. and then by $\frac{1}{4}$ in. up to 2 in., with a $2\frac{1}{2}$ -in. size, and the 22-gage increments of $\frac{1}{8}$ in. from 1 in. to $1\frac{1}{2}$ in., and then by $\frac{1}{4}$ in. to 2 in.

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The Wharton Steel Co., Dover, N. J., is planning for improvements at its new shaft at Upper Hibernia. A section of the shaft, totaling about 400 ft., will be retimbered. New pumping machinery is to be installed.

Consumers' Interest in Iron and Steel Prices

Washington Investigators Emphasize It in Calling Attention Again to the Dangers of Present High Levels—After-War Effects Feared

WASHINGTON, July 24.—Hearty indorsement is voiced here, in and out of Congress, of the suggestion made editorially in the last issue of *THE IRON AGE* that the views of consumers should be considered in any project for the fixing by the Government of iron and steel prices. Whether it is practicable, in view of the tremendous pressure for haste, to give formal hearings to representatives of the great consuming interests is a serious question, but that the users of iron and steel have as much, if not more, at stake than the Government, is a view that is gaining ground everywhere and is forcibly expressed in the following statement made to the correspondent of *THE IRON AGE* by Senator Newlands of Nevada, chairman of the Senate Committee on Interstate Commerce, which recently began a series of hearings respecting prices, cost of production and general trade practices in the industries engaged in the production of coal and other fuels, iron and steel, copper, lead, etc.:

Senator Newlands Fears After Effects

It is my firm opinion that in any plan for the control or fixing of prices the interests of the consumers of iron and steel should be kept constantly in view. This has been my thought from the inception of this discussion, and I have constantly urged that the users of these important basic materials should have the benefit of any arrangement that might be made that would check the sky-rocket prices of these very necessary commodities. It would be most unjust and exceedingly unfortunate from the standpoint of the national welfare if any attempt by the Government to fix prices for its own needs should leave private consumers out of the account or perhaps force them to make up for the reduced prices accorded the Government.

I regard the present situation of the iron and steel industry as embracing elements of real danger to the industries of the country, and I believe that the condition of the iron and steel industry itself is most unwholesome and that a sharp check upon present tendencies would be of material benefit to the entire trade from top to bottom. A wholly artificial condition of affairs has developed as the result of the rapid and unjustifiable advance of prices. Every element of labor has risen in cost and every item of raw material has shared in the rise. The workers in the industry have demanded and have been readily conceded a scale of wages far in excess of normal standards, and it would be difficult, if not impossible, for the managers in the industry to return to the scales in force before the war. To some extent these increases appear to justify higher prices, but what will be the result when the war ends? These hot-house conditions cannot continue, and when the break comes it may be attended by widespread suffering if not industrial disaster.

Iron and steel enter so largely into our leading industries that any danger confronting this great trade must necessarily involve many collateral branches of business, and it is impossible to conceive that any general disturbance in the iron and steel industry will not affect the entire country to a most serious extent. I do not think that either our business men or our legislators have given this subject the attention it deserves, and I hope it will be very carefully considered in any further action the Government may take at this time.

I had hoped that my committee would speedily resume the work of investigation recently undertaken and would soon take up the subject of iron and steel. The pressure for the passage of several important measures,

including the revenue bill, the food control legislation, etc., has become so great, however, and the desire to adjourn at the earliest possible date is so general in both Houses, that I doubt that we shall be able to go any further with our inquiry at this time. I have personally favored the inclusion of iron and steel and other metals in the Federal control contemplated by the food and fuel regulation bill, which has just passed the Senate and which is now in conference, but the majority of the Senate appeared to be of the opinion that the measure should not be complicated by adding other subjects to its provisions. I sincerely hope that, as the result of the work of the Federal Trade Commission, the President will be able to devise a satisfactory basis for the fixing of iron and steel prices and especially that in this adjustment the interests of the private consumer shall be kept constantly in view and fully safeguarded.

The decision not to continue the investigation begun by the Senate Committee on Interstate Commerce, referred to by Senator Newlands, is reluctantly acquiesced in by a majority of the committee. The initial hearings, which were devoted to coal, developed much information that was of value to the Senate in the consideration of the Lever bill for the control of food, feed and fuel, and many Senators have felt that a public investigation by a Congressional committee would have a more salutary effect upon conditions in the iron and steel industry than the confidential inquiry now being conducted by the Federal Trade Commission.

Coke Regulation as Related to Steel

In this connection Senator Pomerene of Ohio, a leading member of the Interstate Commerce Committee, said to the correspondent of *THE IRON AGE*:

I regret exceedingly that it should ever become necessary for the Government to fix prices for commodities, and I hope that those who are dealing in the basic products of the country will be wise enough to keep their prices within such reasonable limits that it may not be necessary for the Government to attempt to control them.

I have just recently gone very carefully into the prices of coal and coke. The producers of these products, which enter into every home, and into every industry, have become so exorbitant in their demands that it is absolutely necessary for the Government to take steps looking toward fixing of prices of these products; otherwise, the poor will freeze and the industries of our country will be paralyzed.

The enormous increase in the price of coal and coke has added from \$15 to \$20 per ton to the cost of every ton of steel that is being produced. This increase in the price of fuel necessarily adds to the cost of iron and steel, but in my judgment there is no sound reason for the present enormous prices in iron and steel. My belief is that unless a change shall soon be made looking toward reasonable prices in iron and steel, it will be necessary for the Government to take a hand. This I shall regret, but it looks as if it would be necessary in order that other industries may be permitted to continue and prosper. The Senate on Saturday by a vote of 72 to 12 declared in favor of the regulation of the prices of coal and coke by the Government. This ought to be something of a warning to the producers of iron and steel.

Senator Pomerene is strongly of the opinion that consumers should be consulted in the fixing of prices of iron and steel. On this point he said:

of the special equipment and productive capacity of a sufficient number of private plants to prevent a recurrence of the situation which the War Department has struggled in vain to meet since the United States became involved in the great conflict.

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Consumers' Interest in Iron and Steel Prices

Washington Investigators Emphasize It in Calling Attention Again to the Dangers of Present High Levels—After-War Effects Feared

WASHINGTON, July 24.—Hearty indorsement is voiced here, in and out of Congress, of the suggestion made editorially in the last issue of THE IRON AGE that the views of consumers should be considered in any project for the fixing by the Government of iron and steel prices. Whether it is practicable, in view of the tremendous pressure for haste, to give formal hearings to representatives of the great consuming interests is a serious question, but that the users of iron and steel have as much, if not more, at stake than the Government, is a view that is gaining ground everywhere and is forcibly expressed in the following statement made to the correspondent of THE IRON AGE by Senator Newlands of Nevada, chairman of the Senate Committee on Interstate Commerce, which recently began a series of hearings respecting prices, cost of production and general trade practices in the industries engaged in the production of coal and other fuels, iron and steel, copper, lead, etc.:

Senator Newlands Fears After Effects

It is my firm opinion that in any plan for the control or fixing of prices the interests of the consumers of iron and steel should be kept constantly in view. This has been my thought from the inception of this discussion, and I have constantly urged that the users of these important basic materials should have the benefit of any arrangement that might be made that would check the sky-rocket prices of these very necessary commodities. It would be most unjust and exceedingly unfortunate from the standpoint of the national welfare if any attempt by the Government to fix prices for its own needs should leave private consumers out of the account or perhaps force them to make up for the reduced prices accorded the Government.

I regard the present situation of the iron and steel industry as embracing elements of real danger to the industries of the country, and I believe that the condition of the iron and steel industry itself is most unwholesome and that a sharp check upon present tendencies would be of material benefit to the entire trade from top to bottom. A wholly artificial condition of affairs has developed as the result of the rapid and unjustifiable advance of prices. Every element of labor has risen in cost and every item of raw material has shared in the rise. The workers in the industry have demanded and have been readily conceded a scale of wages far in excess of normal standards, and it would be difficult, if not impossible, for the managers in the industry to return to the scales in force before the war. To some extent these increases appear to justify higher prices, but what will be the result when the war ends? These hot-house conditions cannot continue, and when the break comes it may be attended by widespread suffering if not industrial disaster.

Iron and steel enter so largely into our leading industries that any danger confronting this great trade must necessarily involve many collateral branches of business, and it is impossible to conceive that any general disturbance in the iron and steel industry will not affect the entire country to a most serious extent. I do not think that either our business men or our legislators have given this subject the attention it deserves, and I hope it will be very carefully considered in any further action the Government may take at this time.

I had hoped that my committee would speedily resume the work of investigation recently undertaken and would soon take up the subject of iron and steel. The pressure for the passage of several important measures,

including the revenue bill, the food control legislation, etc., has become so great, however, and the desire to adjourn at the earliest possible date is so general in both Houses, that I doubt that we shall be able to go any further with our inquiry at this time. I have personally favored the inclusion of iron and steel and other metals in the Federal control contemplated by the food and fuel regulation bill, which has just passed the Senate and which is now in conference, but the majority of the Senate appeared to be of the opinion that the measure should not be complicated by adding other subjects to its provisions. I sincerely hope that, as the result of the work of the Federal Trade Commission, the President will be able to devise a satisfactory basis for the fixing of iron and steel prices and especially that in this adjustment the interests of the private consumer shall be kept constantly in view and fully safeguarded.

The decision not to continue the investigation begun by the Senate Committee on Interstate Commerce, referred to by Senator Newlands, is reluctantly acquiesced in by a majority of the committee. The initial hearings, which were devoted to coal, developed much information that was of value to the Senate in the consideration of the Lever bill for the control of food, feed and fuel, and many Senators have felt that a public investigation by a Congressional committee would have a more salutary effect upon conditions in the iron and steel industry than the confidential inquiry now being conducted by the Federal Trade Commission.

Coke Regulation as Related to Steel

In this connection Senator Pomerene of Ohio, a leading member of the Interstate Commerce Committee, said to the correspondent of THE IRON AGE:

I regret exceedingly that it should ever become necessary for the Government to fix prices for commodities, and I hope that those who are dealing in the basic products of the country will be wise enough to keep their prices within such reasonable limits that it may not be necessary for the Government to attempt to control them.

I have just recently gone very carefully into the prices of coal and coke. The producers of these products, which enter into every home, and into every industry, have become so exorbitant in their demands that it is absolutely necessary for the Government to take steps looking toward fixing of prices of these products; otherwise, the poor will freeze and the industries of our country will be paralyzed.

The enormous increase in the price of coal and coke has added from \$15 to \$20 per ton to the cost of every ton of steel that is being produced. This increase in the price of fuel necessarily adds to the cost of iron and steel, but in my judgment there is no sound reason for the present enormous prices in iron and steel. My belief is that unless a change shall soon be made looking toward reasonable prices in iron and steel, it will be necessary for the Government to take a hand. This I shall regret, but it looks as if it would be necessary in order that other industries may be permitted to continue and prosper. The Senate on Saturday by a vote of 72 to 12 declared in favor of the regulation of the prices of coal and coke by the Government. This ought to be something of a warning to the producers of iron and steel.

Senator Pomerene is strongly of the opinion that consumers should be consulted in the fixing of prices of iron and steel. On this point he said:

The fixing of prices undoubtedly is a serious problem, and whatever agency undertakes it should be fully informed before taking any action. The purpose should always be to fix prices so as to prevent interference with the reasonable prosperity of any industry. We do not want our industrial activities unnecessarily disturbed.

Metal Industries Inquiry

As foreshadowed in THE IRON AGE, the Senate in finally passing the food control bill struck out all reference to iron and steel, copper, lead and other articles not included in the category of food, feed and fuel. In expressing his views as to this decision of the Senate, Senator Newlands, prior to the passage of the bill, delivered a speech, in the course of which he said:

Speaking for myself, I favor adding aluminum, copper, iron and steel to the control provisions of this bill because they are basic commodities which enter into almost all the industries, and which are essential to the successful prosecution of the war, as they are largely used in munitions. The reason why I urge that these commodities should be included is that they are under quasi-monopolistic control. We all know that the control of copper, aluminum, iron and steel is in great corporations which practically, though not perhaps in a legal sense, monopolize these industries, and such an extraordinary demand has been imposed upon these products as to enable the producers to secure sky-rocket prices, the height of which can hardly be measured. . . . It is said we have only to deal with the Government wants. I insist that a virile war can only be conducted by a virile nation; that not only must your army be strong, but that your people must be strong; that your army must not only be well fed and well equipped, but that your people also must be well fed and well equipped, and that it is folly to attempt in the emergency of war to make a distinction between the treatment that should be accorded to the army and that accorded to the people at large. Big men ought to see this.

These men who are big enough to conduct the copper, the steel, and the aluminum industries of the country ought to be able to see this. Besides this, as economists they ought to realize the fact that they themselves are inaugurating a price level which will provoke a constantly increasing wage level, and that the end of the war will find us, as the result of the struggle between the wage earners on the one hand and the producers on the other, with a wage level raised to some correspondence with the price level. We will find at the end of this war a wage level far above that of any other country in the world; and just then, when competition will again come between nations for the commerce of the world, we shall find the United States at a disadvantage which will involve a struggle between the wage earners and the producers, and lock up the entire industries and energies of the country.

Steel Cost Inquiry Complicated

The Federal Trade Commission is not yet able to forecast the date upon which it will deliver to the President the data concerning the cost of producing iron and steel, which, presumably, will be used as the basis for fixing prices for the Government's requirements, and possibly for the Allies and the general consuming public. Complications have arisen, notably with respect to costs of production in large and small concerns, and the whole problem looks bigger to-day than when it was undertaken. The agents of the commission are working very industriously, however, and hope to finish their task at an early date.

Committee on War Expenditure

After striking iron and steel and other metals from the control provision of the Lever food, feed and fuel bill, the Senate added an important section creating a joint committee of Congress on war expenditures. This section is as follows:

Sec. 23. A joint committee of the Senate and House of Representatives shall be appointed, composed of five Members of the Senate, including three Democrats and two Republicans, and five Members of the House of Representatives, including three Democrats and two Republicans, to be known as "the joint committee on expenditures in the conduct of the war."

It shall be the duty of said committee to keep itself advised with regard to the expenditure of all appropriations bearing on the conduct of the war made by Congress and the contracts relating thereto made by officers of the executive departments, and it shall be the duty of the executive departments, on request, to keep said committee fully advised as to such expenditures and contracts.

Such committee shall confer and advise with the President of the United States and the heads of the various executive departments, commissions, voluntary boards, or other organizations connected with the conduct of the war, with a view to safeguarding expenditures, and shall report to Congress from time to time in its own discretion, or when requested to do so by either branch of Congress.

The membership of such committee shall be designated by the respective committees of the Senate and House which select the members of the regular standing committees.

Such committee shall have power to act by subcommittee or otherwise, and to send for persons and papers, and administer oaths, to summon and compel the attendance of witnesses, and to employ such clerical, expert and stenographic assistance as shall be necessary; and to pay the necessary expenses of such committee there is hereby appropriated, out of any money in the Treasury not otherwise appropriated, the sum of \$50,000, to be paid out upon the audit and order of the chairman or acting chairman of said committee.

The President's Opposition

This provision, which was adopted by a vote of 53 to 31, is now before the conference committee, where it promises to prove a bone of sharp contention. Although supported by a number of Democratic Senators, it is strongly opposed by President Wilson, who has written a letter to Representative Lever, author of the original bill, in which he says in part:

Section 23 is not only entirely foreign to the subject matter of the food administration bill in which it is incorporated, but would, if enacted into law, render my task of conducting the war practically impossible.

I cannot believe that those who proposed this section scrutinized it with care or analyzed the effects which its operation would necessarily have.

The constant supervision of executive action which it contemplates would amount to nothing less than an assumption on the part of the legislative body of the executive work of the administration.

There is a very ominous precedent in our history which shows how such a supervision would operate. I refer to the committee on the conduct of the war constituted by the Congress during the administration of Mr. Lincoln. It was the cause of constant and distressing harassment, and rendered Mr. Lincoln's task all but impossible. . . .

I sincerely hope that upon the reconsideration of this matter both houses of Congress will see that my objections rest upon indisputable ground, and that I could only interpret the final adoption of section 23 as arising from a lack of confidence in myself.

Many Members and Senators favor the appointment of a committee on war expenditures, with power to sit during the recess of Congress, as a basis for the adjournment of both Houses as soon as the war revenue bill has been enacted. It was felt that some agency directly responsible to the House and Senate should remain in Washington continuously during the period of the war, and this feeling will undoubtedly be reflected in pressure upon the Conference Committee to accept section 23 in spite of the President's opposition.

W. L. C.

Pittsburgh and Nearby Districts

Six of the 10 double hot tin mills of the Shenango Works of the American Sheet & Tin Plate Co., at New Castle, Pa., were in operation last week, and it is expected that the other four mills will be started in a short time.

The William B. Pollock Co., Youngstown, Ohio, has received a contract for the building of a blast furnace for the Alan Wood Iron & Steel Co., at Swedeland, Pa. This will be a 500-ton furnace of the Julian Kennedy type "F" design, and will be equipped with four stoves, 23 x 110 ft. It will also have four additional Pollock standard metal ladle cars. The 500-ton blast furnace which the William B. Pollock Co. is building for the Whitaker-Glessner Co. at Portsmouth, Ohio, will be equipped with a Pollock type metal ladle transfer car, which takes the molten metal from the furnaces and charges it direct into the open-hearth furnaces without the usual use of an overhead crane and portable charging spout. The William B. Pollock Co. recently received a contract from the Carnegie Steel Co., Pittsburgh, for remodeling two of its Edgar Thomson's furnaces at Bessemer, Pa.

The Frick Coke Co., Pittsburgh, has made some adjustment in working conditions in mines and coke ovens in Western Pennsylvania, putting into effect an eight-hour work day as far as possible. This new move became effective last week.

The Kirk Supply Co., Pittsburgh, has recently taken a contract for equipment as follows: 25 charging box cars built by the Easton Car & Construction Co., Easton, Pa., for delivery to the Canton Sheet Steel Co., Canton, Ohio; six cars of similar type for the Edgewater Steel Co., Pittsburgh, with works at Oakmont, Pa.; complete foundry flask requirements to be furnished by the Sterling Wheelbarrow Co., Milwaukee, Wis., for the Producers Supply Co., Franklin, Pa.; three $\frac{3}{4}$ -yd. concrete mixers of the Marsh Capron type, and 1000 Sterling column clamps for the Union Switch & Signal Co., which is building a new plant at Swissvale, Pa.

Contracts for electrical equipment for the plants of the Chile Copper and Braden Copper companies in Chile, have been taken by the Westinghouse Electric & Mfg. Co., East Pittsburgh, and involve 15 rotary converters, each having a capacity of 3750 kilowatts. Most of the original machinery in Chile came from Germany, but since the war, most of the equipment has been purchased in the United States. It is expected that when the Chile Company plant is completed it will have a capacity of 118,000 kw. The Braden Copper Co., which like the Chile Copper Co. is a Guggenheim interest, is doubling its plant in the southern part of Chile.

Unusual Explosion in an Iron Foundry

The following account of a remarkable explosion in an Italian iron foundry has been published in the *London Iron and Coal Trades Review*, with the request that its readers throw any light on the cause they can or refer to a similar accident:

In an Italian foundry in which shells of semi-steel are being cast, a group of cupolas is served by Root blowers. On a recent occasion, after the cupolas had been set going with the natural draft, the electric starting switch of the blower was closed, whereupon a violent explosion took place, shattering the casing, but not injuring seriously the moving parts of the blower. The explosion was so violent as to displace several heavy tanks from their bases. The explanation offered by the management is that an explosive mixture had been produced by carbon monoxide finding its way from the cupola into the blower and that the mixture was fired by a spark produced by friction by one of the rotors of the blower. The explanation seems to be feasible but the possibility of an electric spark due to leakage is not altogether excluded in our opinion.

The *Revue de Metallurgie*, Paris, for January-February, 1917, has a detailed article by the well-known French author, M. Leon Guillet, on "The History of the Basic Process in the Manufacture of Steel," with life and portraits of Sidney Gilchrist Thomas, and photographs of his tomb and epitaph in the Passy Cemetery.

Steel Corporation to Build Ships

The United States Steel Corporation has announced plans for a steel shipbuilding plant to be established on the Hackensack Meadows, near Newark. A subsidiary company has been incorporated as the Federal Shipbuilding Co., of which the incorporators are William W. Corlett of New York, assistant solicitor of the corporation, and Kenneth B. Halstead and Edward F. Briggs of Hoboken. The Federal Shipbuilding Co. is capitalized at \$3,000,000, but unlimited capital for the plant will be supplied by the Steel Corporation. There will be an initial outlay, Judge Gary says, of \$6,000,000. Twelve steel shipways will be built, and it is expected to have the plant ready to build steel ships in six months.

Eighty-six acres of land were purchased through Joseph P. Day, a few days ago, and this, added to another strip recently acquired, makes a total of 150 acres to be used by the new plant. There will be ample space for one of the biggest shipbuilding plants in the United States.

Robert MacGregor, a marine engineer, who has been connected with the Steel Corporation in an advisory capacity, will have charge of shipbuilding operations. While the plant will be made ready to accept Government contracts, it will probably also engage in the building of vessels on private contract. These vessels will be of a standardized type, and of a capacity ranging from 6000 to 10,000 tons deadweight.

AVIATION BILL PASSED

War Department Hopes to Have 3500 Airplanes This Year

WASHINGTON, July 24.—The Senate on July 21 passed without amendment the House bill appropriating \$640,000,000 for the creation of an Aviation Corps of 100,000 men, the construction of 22,000 airplanes equipped with high-powered engines, and the manufacture of approximately 40,000 machine guns to be used as armament for the airships. The bill will probably receive the President's approval before this issue of THE IRON AGE reaches its readers. As the aviation bill was introduced in the House less than a fortnight ago its speedy passage by both houses constitutes a conspicuous record for war legislation.

The bill clothes the President with extraordinary power to take steps, through the War Department, "for the purchase, manufacture, maintenance, repair, and operation of airships and other aerial machines, including instruments and appliances of every sort and description necessary for the operation, construction, or equipment of all types of aircraft, including guns, armament, ammunition, and all necessary spare parts and equipment connected therewith; and all necessary buildings for equipment and personnel in the Aviation Section and for the purchase, maintenance, repair, and operation, through the Chief Signal Officer of the Army, of all motor-propelled passenger and equipment carrying vehicles which may be necessary for the Aviation Section of the Signal Corps." The bill further authorizes the appropriation to be used for the acquisition of land and the erection of any buildings necessary to be used as a barracks, hangars, magazines, storehouses, shops, garages, etc., and for the "purchase, manufacture and installation of all kinds of machinery, tools, materials, supplies and equipment for the construction, maintenance and repair of aircraft, buildings, and improvements in aviation stations, or property, or appliances to be used in connection with aviation."

The officials of the War Department hope during the remainder of the present calendar year to produce at least 3500 airplanes, the majority of which will be for the instruction of fliers, and there is some talk of bringing British and French aviator student officers to the United States as instructors.

CORRESPONDENCE

Cast Steel Electrically Welded Ships

To the Editor.—In view of the publicity which the daily papers gave the recent article in THE IRON AGE on the proposal to build cast-steel ships, it may be pertinent to make a few comments on the merits of such an undertaking.

To repeat the scheme in a few words, it is proposed to make the ship hull out of standardized cast steel sections of say 8 ft. by 30 ft. random sizes, bolt these at convenient places, and then weld by electricity the abutting edges into a homogeneous unit. A footnote informs the reader that there is nothing marvelous or extraordinary about this; in fact, it is an everyday affair—except that as proposed it is on an unusually large scale.

I beg to differ materially from Myron F. Hill and to say that if undertaken such a project would be the death warrant of the entire electric welding industry. However, there is no immediate danger of such an outcome, inasmuch as even Mr. Hill admits that it will take him some five months time to build the necessary shipyards, runways, cranes and a few minor details—for a 6,000,000-ton annual production.

This part of the project being settled, we might turn our attention to the welding end of the scheme. It is stated by Mr. Hill that one shipyard will be able to turn out a hundred 5000-ton vessels per month. It is assumed that by tonnage, cargo carrying capacity is meant. One such vessel would be about 300 ft. long, about 40 ft. beam and, say, 30 ft. deep from the top of the plates to the upper main deck. Assuming furthermore that the yards will work day and night, Sundays and holidays as well, and leaving off all fractional parts, one yard must turn out during 24 hours three ships as per the above given approximate dimensions. (This stunt might prove to be of some interest to General Goethals.)

Roughly speaking, it will take about 115 pieces, each 8 ft. by 30 ft., to form a hull—providing, of course, that such sizes could be conveniently cast, handled and used on all parts of the ship. On this basis we have about 5000 ft. of welded seams per hull. We are informed that by using the system of the Wilson Welder & Metals Co. this 1100 miles of annual welding will be far superior to riveted joints and watertight, of course. I dare to make a guess that the Wilson Welder Co. uses a constant potential multiple arc-welding system. Judging from its experience, it must have had some slight difficulties with porous welds. This we are justified in assuming, because Mr. Wilson says:

"An operator finds difficulty in holding the tool at a fixed distance from the work. An unsteady hand causes the distance to vary, thus varying the resistance over which the arc from the tool to the work has to pass. This variation may cause a variation in the current sometimes as much as 15 amp., with the result that the weld becomes porous."

This brief statement of Mr. Wilson gives the clue to the entire situation, which is that the Wilson Welding & Metal Co. has the same difficulties with its system that all other arc welding systems have, whether Bernardos, Slavianoff, constant potential, constant current, series or multiple—namely, stability of the arc and porousness.

I have no space to go into the details of the good, bad or indifferent means for improving the stability of the arc or to avoid porousness. Neither is it my intention to belittle arc welding as an art. I am myself somewhat of a welding man, and it is but natural that I should be enthusiastic over the immediate future of welding. I only wish to point out that arc welding is not as yet ready to be adapted to such a titanic task as Mr. Hill proposes.

Upon investigation I found that the Wilson welding system is not any better than any of the other arc welding systems now in the market. I also wish to call

Mr. Hill's attention to a slight oversight in his patent specification No. 1,187,404. The generator shunt field as well as the pencil feed cable has the same identification number. This seems to have escaped detection at the Patent Office.

While I must confess my ignorance about the proposed type of cast steel ships (information withheld on account of strategic reasons), even if I am underestimating by 100 per cent the actual welding work, it seems somehow that 720 welders ought to do about twice as much work as Mr. Hill estimates. Granting, without accepting it as a fact, that welded joints are stronger than riveted ones, I would also recommend to Mr. Hill to make a few rough calculations as to where the transversely running seams on his standardized ships will come and avoid placing one in what is called the resonance line. He might find there that his welds are not stronger, only more rigid, and in that case he might have some startling experiences.

In conclusion allow me to say that in the interest of the welding art it is most important before venturing into new fields to advocate conservatism rather than radicalism. The greatest difficulty in the welding industry is usually to overcome the prejudice which still exists among professional outsiders. Venturing into untried fields and in competition with well-known and well-tested methods requires first of all being able to prove beyond doubt the validity of our claim. No matter how much to my regret, I am forced to say that for certain fields welding is not as yet adapted. Welding cast-steel ships for such service, size and quantity as proposed by Mr. Hill is one of those fields.

SANDOR I. OESTERREICHER,

Assoc. American Institute Electrical Engineers.
NEW YORK, July 20, 1917.

Interesting History of a Furnace

To the Editor: Last week the Jefferson Iron Co. shipped from its furnace near Oak Hill in Jackson county, Ohio, the last iron on the yard and formally went out of business.

The Jefferson Iron Co. was organized early in 1845, the plant being built and the first iron being made that year. The stockholders were altogether of Welsh people, Jackson and Gallia counties in Ohio having, between the years of 1818 and 1840, received a very large number of emigrants from Wales. The stockholders of the Jefferson company were deeply religious men and when the furnace was started they held a formal meeting and agreed among themselves that the furnace would never operate on Sunday. And this agreement was never, during all the years of its operation, broken. Every Saturday night, the furnace was banked, and with the exception of the watchman, there was no workman about the place.

The furnace ran continuously from 1854 to the early part of 1917 except during occasional periods of depression in business, when it was out because the iron could not be sold. At first the furnace produced the genuine old-fashioned cold blast iron. More recently the iron has been warm blast, and from an output of three or four tons a day they raised to 12 tons a day. This furnace survived the period when the Hanging Rock region was the greatest producing iron district in the United States. In the Hanging Rock district, which included the Ashland section in Northern Kentucky, there was a total of 90 blast furnaces shortly after the Civil War. Day by day the competition of coke iron forced them out of business. A few became coke furnaces, but most of them simply closed up shop, were dismantled and sold for scrap.

The Jefferson Iron Co. after the Civil War cut a melon (\$300,000) making all of its stockholders rich. At that time, this sum of money was a tremendous amount. At the end of the Civil War, it sold iron for \$90 a ton. The original capital stock of the company was \$50,000, and it has divided since it started business more than a million dollars in dividends. All of its stockholders, very early in the history of the company, received back in dividends their entire subscription, so that for a period of practically 57 years the stockholders have been on velvet.

The Jefferson furnace gave employment to at least four generations, and during the years when general business was so very dull and Jackson county suffered so severely from a lack of industrial development, the chopping of wood and the mining of native ore were constant sources of revenue to the farmers and to the town people generally.

With the shutting down of Jefferson ends the last word of one of the most interesting industrial chapters in the history of the United States.

Of course, with the great modern coke furnaces at Ironton, Ashland and Jackson, the Hanging Rock district does not cease to make iron. In tons it is making much more iron to-day than it did when all of the 90 charcoal furnaces were running, it is giving employment to many more men, it is making more money for the stockholders of the companies than in the days that went by. But the flavor, the romance and adventure that marked the Hanging Rock district have disappeared. Everywhere the old foundry men in this country remember the Hanging Rock charcoal iron as superior to anything else that they have ever used—superior at least in the traditions of its excellence.

THE MATTHEW ADDY CO.,

James A. Green, President.

CINCINNATI, July 23, 1917.

Pedagogical Influence

To the Editor: An incident which has just come to the writer's attention, together with conversations which he has had from time to time with different instructors, seems to indicate a practically unknown influence which is working against industrial production.

We have lately offered some good opportunities to graduates of high schools, particularly those who have taken the vocational courses. One of these applicants wrote that he could not consider any proposition of less than \$2.50 a day and no piece work. It is, of course, the latter stipulation which is significant.

The instructors referred to express a firm belief that the workman is being exploited and should take a stand for his rights. These rights are described as being entitled to more compensation without increased production. If these sentiments are being instilled into the boys while receiving their instruction, the systems of piece work or bonus are, no doubt, being cited as examples of exploitation. Not only is this hurtful as abetting the general attitude of trades unions, but it is harmful to the boy as an individual in that he is sent out with the idea of obtaining reward without effort.

While there may be little or nothing in the coincidence, the matter will, at least, bear watching.

H. D. MURPHY.

Jersey City, N. J., July 19, 1917.

Japan's copper ore output in 1916 was 111,562 tons, as compared with 83,017 tons in 1915 and 78,700 tons in 1914, according to the British commercial attaché at Yokohama, furnished to him by one of the largest copper mine owners in that country. Exports amounted to 57,402 tons in 1916, as compared with 56,528 tons in 1915 and 43,305 tons in 1914. Russia now buys 60 per cent of Japan's copper exports; the United Kingdom takes 20 per cent, while France, the United States and India share the remainder. The consumption of copper ore in Japan has increased considerably during the last three years, amounting in 1916 to 59,690 tons, as compared with 27,723 tons in 1915 and 32,045 tons in 1914.

Edward T. Edwards, Columbia, Pa., operating the East End Rolling Mills, has completed remodeling and improvement work at the Union Street rolling mill, recently acquired, and plans to place the plant in full operation at an early date.

The San Francisco office of the Sullivan Machinery Co. is now in the Hobart Building, 582 Market Street, having removed from its former location in the Sheldon Building, 461 Market Street. Ray P. McGrath is manager.

CONTROVERSY IS ENDED

Goethals and Denman Succeeded by Admiral Capps and E. N. Hurley

WASHINGTON, July 24.—President Wilson sharply terminated the Goethals-Denman controversy to-day by accepting the resignation of General Goethals as manager of the Emergency Fleet Corporation and suggesting to Chairman Denman of the Shipping Board that he too resign, a suggestion that was promptly complied with. At the same time, the President accepted the resignation, tendered some weeks ago on account of ill-health, of Captain J. B. White, a member of the board. Admiral Capps, a naval constructor of high reputation, is slated to succeed General Goethals as the general manager of the Emergency Fleet Corporation and Edward N. Hurley, formerly chairman of the Federal Trade Commission and now a member of the Export Council, has been chosen to succeed Mr. Denman. Bainbridge Colby, of New York, will be appointed to succeed Captain White as a member of the board.

Admiral Capps, who succeeds General Goethals, is one of the most experienced constructors in the naval service and, although his abilities have never been tested by any such task as the building of the Panama Canal, it is the opinion here that the President could not have found a more capable man without going outside the Government service.

Before the President's action was made known, the Senate had taken a hand in the Shipping Board controversy and had adopted a resolution offered by Senator Smoot, of Utah, for information concerning the plans of the board, as follows:

Resolved, That the President be, and he hereby is, requested to transmit to the Senate such information as may be in the hands of the Shipping Board to show what contracts have been let or are pending for the construction of ships under the authority of that board, the names of the contractors, the location and capacity of their yards, the price per ton to be paid to them, the nature and amount of any advances to be made to them from Government funds, together with any other information which will indicate the disposition of appropriations already made for the uses of the Shipping Board or which will assist the Senate in the consideration of requests from the said board for further appropriations.

There are ample precedents for the refusal of the President to supply the information called for in this resolution if it should be deemed inadvisable to make it public at this time. On the other hand, both the President and the members of the Shipping Board will be keenly alive to the fact that if Congress is to be requested to supply another half billion dollars to be spent by the board, it will be exceedingly poor diplomacy to refuse it information unless the public interest unquestionably requires it. It is probable that the board will furnish at least part of the data called for in the Smoot resolution.

A collateral matter of much interest here is an agreement which it is announced has been entered into by Shipping commissioners designated by President Wilson and the British Foreign Office and acquiesced in by all the Allies with the possible exception of Japan. This agreement proposes the radical downward revision of ocean freight rates and the practical taking over by Great Britain and the United States of the operation of all allied merchantmen in the Atlantic. The Japanese Government is said to have demurred at entering into this arrangement on the lines proposed, but has promised to place as many Japanese merchant vessels in the transatlantic trade as can possibly be provided to help render ineffective the submarine warfare. The position of Japan in this matter will be definitely determined when the Japanese mission headed by Vice-admiral Takeshita reaches the United States.

It is stated that negotiations looking to this agreement were begun at the instance of President Wilson and in line with his open letter to the industrial leaders of the country, published July 11, in which he dwelt with much emphasis upon the embarrassment caused by the almost prohibitory ocean freight rates demanded

by ship-owners during the past year. The details of the agreement will probably be worked out in the course of a few days when an official announcement will be made respecting the matter.

The Manufacture of Phosphor Bronze

While phosphor bronze and its properties have long been known, its method of manufacture has been carefully guarded, writes Prof. W. W. Rogers, metallurgist Stamford Rolling Mills Company, Stamford, Conn., in a pamphlet published by that company. He gives the following description of the way in which it may be produced:

The phosphor bronze that has the best all-round properties for rolling and drawing into wire has the following approximate composition:

	Per Cent
Copper	95
Tin	5
Phosphorus	0.05 to 0.15

This alloy when annealed has a tensile strength of about 47,000 lb. per sq. in. and an elongation of about 70 per cent. When rolled or drawn to spring temper, it will show 120,000 lb. to the sq. in., with an elongation of only 2 per cent or less. Fine wire will give 160,000 lb. tensile strength and over. At maximum spring temper the ultimate breaking strain and the elastic limit are almost identical, with practically no elongation.

In its manufacture the first step is to prepare the phosphor copper. This is done by heating copper ingots in a graphite crucible to almost their melting point, but not allowing it to flow. When this temperature is attained, yellow stick phosphorus is thrown in, which at once combines with a portion of the copper with a sufficient rise in temperature to melt it. The throwing in of phosphorus is continued until the charge has melted and covered the copper unacted upon. It is then poured into shallow slab molds, and when cold may be easily broken up. This process yields a phosphor copper containing from $4\frac{1}{2}$ to 5 per cent phosphorus.

The next stage is to alloy this phosphor copper with tin in the following proportions:

	Per Cent
Phosphor copper	$51\frac{1}{2}$
Tin	$48\frac{1}{2}$

The phosphor copper is first melted in a graphite crucible, the tin added, heated until thoroughly fused, well stirred, and poured into shallow slab molds. To complete the process it is only necessary to alloy copper with the phosphor-copper-tin alloy, the making of which has been described above. A hundred pound charge would consist of 90 lb. of high-grade copper and 10 lb. of the phosphor-copper-tin alloy. To do this, melt the copper under charcoal, add the phosphor-copper-tin alloy, raise the temperature to the required pouring heat, mix thoroughly and pour into molds of convenient size and shape.

Great caution must be exercised in handling the phosphorus used in the making of the phosphor-copper. The contents of the tins in which the phosphorus is sold should be emptied into a bucket containing water, and the sticks of phosphorus completely submerged. The hands should be protected with asbestos gloves, for, if the phosphorus ignited, it would cause serious burns.

It is announced by Frank B. Baird, president of the Buffalo Union Furnace Co., Buffalo, that the blast furnace of the Burden Iron Co. at Troy, N. Y., recently leased by him on behalf of his company is being put in condition for operation as rapidly as possible and will commence making iron between the middle and the latter part of August. The capacity is about 250 tons daily.

The Mayer Bros. Co., Mankato, Minn., manufacturer of tractors, power hammers, etc., is enlarging its plant by the addition of a foundry addition, 36 x 116 ft., and a machine shop, 40 x 80 ft. The company has installed about \$6,000 worth of new machinery since February.

NEW TRADE PUBLICATIONS

Portable Flood Light.—Coffin Valve Co., Boston. Pamphlet. Concerned with a portable flood light for use in factories and machine shops where temporary special lighting is required. The device consists of a standard with two swivel and one ball joints and a telescoping arm, enabling the light to be easily and quickly adjusted for illuminating any desired spot. A number of views showing the adjustments possible for use on machines or on the floor are included.

Belting.—Stanley Belting Corporation, 32 South Clinton Street, Chicago. Pamphlet. Devoted to a line of solid woven cotton belting impregnated with a special compound. The advantages claimed for this belting are flexibility, uniform thickness, cheapness and absence of continual stretch and plies or laps to come apart. A table giving the horsepower transmitted by the belting at various speeds is presented, together with a price list of the sizes. Mention is made of the different fastenings for use with the belt and brief instructions for its care are presented.

Tackle Blocks.—Western Block Co., Lockport, N. Y. Pamphlet. Refers to an extensive line of blocks for manila and wire rope. Views of the various blocks that can be regularly supplied are presented with a table of prices and sizes on either the facing page or underneath the illustration. Mention is made of the various iron and sheaves that can be furnished, as well as special blocks, phosphor bronze bushings and small eye hooks.

Superheaters.—Power Specialty Co., 111 Broadway, New York. Bulletin No. M-1. Devoted to a line of superheaters for use on marine boilers. Among the advantages claimed for the superheater are maximum fuel and water economy at moderate temperatures, accessibility and the elimination of any necessity for change to boiler or tubes. The construction of the superheater is gone into at some length, and a number of views of the superheater and vessels upon which it has been installed are included.

Balancing Machine.—N. W. Akimoff, Philadelphia. Pamphlet. Gives general description and specifications for a dynamic balancing machine for various types of rotating apparatus, such as motor armatures, crankshafts, etc. The description of the machine is brief but complete and the text is supplemented by numerous illustrations.

Cleaning Compound.—Oakley Chemical Co., 22 Thames Street, New York. Information sheet No. \$60. Points out the advantages of using Oakite plater's cleaner for all sorts of metal work. A general discussion of the subject of cleaning and the equipment required is presented, followed by instructions for cleaning various kinds of metal products.

Automatic Solenoid Brakes.—General Electric Co., Schenectady, N. Y. Bulletin No. 48,900. Illustrations and descriptive matter explain the operation of a line of solenoid brakes which are used for stopping rotating parts more or less quickly. When the power is cut off the brake sets and applies a retarding force to the shaft through friction between the brakeshoes and the wheel. The solenoids employed with the brakes are also illustrated and briefly described.

Cotter Pins.—American Chain Co., Inc., Bridgeport, Conn. Pamphlet. Calls attention to the Campbell hammer-lock self-spreading cotter pin, which is locked by a light blow on the head. A brief description of the pin and the way in which it is inserted, locked and removed is presented, the text being supplemented by illustrations of the three steps. A price list covering all the sizes made with the different sizes of packages and the weight of 1000 pins is included.

Reflectors.—National X-Ray Reflector Co., 235 West Jackson Boulevard, Chicago. Catalog No. 20. Describes and illustrates a line of reflectors for directing and controlling light in commercial and flood illumination. A brief description of the reflectors, which are made from a single piece of blown glass with corrugations designed to break up and diffuse the light rays, is given, and numerous engravings of the various reflectors and diagrams of the light distribution are presented, together with a number of illustrations of actual installations. Mention is also made of a line of reflectors for show windows and cases and the different fittings and fixtures employed.

Second-Hand Machinery.—S. Nemirovsky & Son, 136 North Third Street, Philadelphia. Folder. Mentions the line of new and second-hand machinery and tools, dynamos and motors which are regularly carried in stock.

Machinery Markets and News of the Works

MAY COMMANDEER TOOLS

Sidetracking of Private Work Likely

Government Business Occupies Attention of Trade Almost Exclusively—Shipbuilding, Motor Truck, Airplane and Munitions Concerns Buy

Commandeering of machinery and machine tools for the benefit of Government work is forecasted by the action of several builders in sending out letters to their customers inquiring as to the purposes to which recent orders are to be put. If such purchases have been made for private manufacturing, it is the understanding the information will be given to the Priority Board at Washington, which will probably, in some instances, divert such shipments to plants engaged in Government work. This is only one of many indications of the almost complete side-tracking of private business in favor of the Government.

Shipbuilding contracts, which it was expected might be awarded last week, will probably soon be awarded, now that the emergency fleet controversy is settled. It is said that progress is being made on the plans for the Government shipyards near Philadelphia and Newark, in which the American International Corporation, the Submarine Boat Corporation and the Lackawanna Bridge Co. are unofficially said to be co-operating. The Federal Shipbuilding Co., which is financed by the United States Steel Corporation, will build a \$6,000,000 shipbuilding plant, with 12 shipways, on the Hackensack Meadows. The Groton Iron Works will build a \$2,000,000 steel shipbuilding plant at New London, Conn., and is in the market for equipment, including cranes and machinery and tools for plate and machine shops. Reports from Seattle say that four plants in that city and three in Portland, Ore., are now at work building steel ships, and that two more plants are being equipped in Seattle.

Passage of the bill appropriating \$640,000,000 for airplanes is bound to bring out a large demand for machine tools, some of which has already appeared. The Curtiss Aeroplane & Motor Corporation is buying and the Wright-Martin Aircraft Corporation and the General Vehicle Co. are understood to be preparing to take Government contracts for motors. The Packard Motor Car Co. of Detroit and the Willys-Overland Co. of Toledo, Ohio, last week placed orders aggregating \$65,000 with Cleveland dealers for tools for airplane motors and another similar order is pending in the Cleveland market for \$40,000.

Motor truck contracts aggregating 10,650 chassis, with a total value of \$33,179,026, will stimulate demand for tools and machinery. The General Motors Co., Detroit, will build a new forge shop and wants nine 10 to 15-ton cranes and shop machinery.

The Government will spend \$5,000,000 for buildings at the Washington Navy Yard to manufacture torpedoes, mines, mounts, etc., and \$2,500,000 in equipping

these shops. The General Electric Co., Schenectady, N. Y., is in the market for about \$1,000,000 worth of equipment for making turbines; this in addition to orders placed within the past few months aggregating \$3,000,000. The Singer Sewing Machine Co., New York, wants 300 to 400 machines. The American Ammunition Co., A. Schrader's Son, Inc., and the Marlin Arms Corporation are in the market for tools for making munitions. Westinghouse, Church, Kerr & Co. and Stone & Webster, who are building shops at the Rock Island Arsenal, Rock Island, Ill., will buy a large quantity of equipment. The Brier Hill Steel Co., Youngstown, Ohio, is in the market for 15 machine tools, about half of which are lathes from 16 to 42 in.

There is an active demand from shipyards for cranes. The Lackawanna Bridge Co. wants delivery in two months of four 5-ton cranes to be used in equipping the Government shipyard on Newark Bay. The General Electric Co. has closed for 12 cranes.

Among export inquiries is one for 60 42-in. lathes for Italy, duplicating a former order which was submerged. A statement which is believed to be reliable is to the effect that 40 per cent of export shipments of machinery and machine tools in recent months have been sent to the bottom by Germany's U-boats. Takata & Co., New York, have concluded purchases aggregating \$800,000 for the equipment of a tube and pipe works in Japan. Tools for Calcutta, India, have been inquired for in Boston.

New York

NEW YORK, July 23.

Government orders aggregating \$2,500,000 will probably soon be placed for the equipment of new shops to be built at the Washington Navy Yard for the manufacture of mines, mounts, torpedoes, telescopes, sights, optical instruments and miscellaneous ordnance supplies. An appropriation of \$7,500,000 has been asked for to erect and equip the buildings.

This and similar large orders which are either directly or indirectly for the Government are occupying the attention of the trade almost to the exclusion of all private business. In fact, orders recently placed for machinery and machine tools by manufacturers are being investigated to determine whether they are to be used on Government or private work, and, if for the latter, they will probably be commandeered for the Government.

Manufacturers of airplanes, motor trucks and munitions are in the market. The passage of the \$640,000,000 airplane appropriation by Congress has stimulated a great deal of inquiry from manufacturers of airplane motors. The General Vehicle Co. and the Wright-Martin Aircraft Corporation have been "feeling out" the market and are understood to be expecting Government airplane contracts. The Curtiss Aeroplane & Motor Corporation is buying for its Buffalo and Hammondsport factories.

The closing of U. S. Army contracts with the Four-Wheel Auto Drive Co., the Packard Motor Car Co., the Locomobile Co., the Nash Motors Co., the Garford Motor Truck Co. and the Pierce-Arrow Motor Co. for 10,650 motor trucks, at a cost aggregating \$33,179,026, was noted with interest by the trade, as it will stimulate some demand for machine tools.

Expected contracts for steel ships had not materialized at this date (Tuesday) owing to the failure of Chairman Denman of the Shipping Board and General Goethals to settle their differences. Some progress is being made, it is said, on plans for the Government shipyards, which will be

established near Philadelphia and Newark. The American International Corporation is understood to have placed tentative contracts for machinery for the Philadelphia plant, and the Lackawanna Bridge Co., which, in co-operation with the Submarine Boat Corporation, is to establish the Newark plant, indicated that it is going ahead with the work of equipping the yard by sending out an inquiry last week for four 5-ton cranes, and it is understood that an inquiry for other cranes will follow. The Downey Shipbuilding Corporation, 120 Broadway, has formally taken possession of the fabricating plant of Milliken Bros., Inc., Staten Island, and will at once equip it for a shipbuilding plant. The Groton Iron Works, 50 Broad Street, is understood to be expecting a Government contract for steel ships in addition to the wooden-ship contract it received some time ago, and will spend \$2,000,000 in equipping a plant at New London, Conn. It is in the market for bridge, yard gantry and locomotive cranes and equipment for a plate shed and machine shop. The Foundation Co., Woolworth Building, New York, is reported to have taken a contract to build 40 wooden ships for the French Government, with a possibility of this order being doubled or tripled, and is inquiring for equipment. The American U-Boats Co., 21 Park Row, New York, a new company, is inquiring for about a dozen machines for a plate shop. It is said that this company plans on building under-sea cargo boats.

The General Electric Co. is again in the market, having only recently closed on the last of a lot of equipment for the Schenectady works totaling about \$3,000,000. Its inquiries at present call for about \$1,000,000 worth more. All of this equipment, it is understood, will be utilized in the manufacture of turbines for the United States Navy. The Singer Sewing Machine Co. is inquiring for 300 to 400 milling machines, drill presses and automatic screw machines, which are said to be for export to one of its foreign factories. The American Ammunition Co., 25 Broad Street, New York, is inquiring for tools for its plant at Bordentown, N. J., where munitions will be manufactured for the Government. A. Schrader's Son, Inc., Brooklyn, which also has a Government munitions contract, is in the market for automatic screw machines. The Marlin Arms Corporation, Philadelphia, formerly the Standard Roller Bearing Co., is inquiring for a list of tools wanted for munitions making. Westinghouse Church Kerr & Co., New York, are inquiring for about 90 machines wanted for buildings being erected at the Rock Island Arsenal, Rock Island, Ill. Stone & Webster are also in the market for machinery for this arsenal.

Crane builders are receiving requests for early deliveries from shipyards and others, but are unable to promise anything shorter than six months in most instances. Second-hand cranes are being purchased in numerous cases to obtain earlier shipments. The American International Corporation and the Submarine Boat Corporation and Lackawanna Bridge Co. will require a large number of cranes for the Government shipyards, and it probably will be necessary to commandeer these if the expected progress is to be made in equipping these plants. There is a good demand for cranes for all purposes, including those used for the handling of coal, ore, etc. Locomotive crane builders are sold up for six months, but have quite a lot of business in private contracts which can be diverted to Government account, if required. The General Electric Co. last week closed for 12 cranes of 5, 10 and 15-ton capacity. The Penn Seaboard Steel Corporation, Philadelphia, bought a 10-ton crane.

Export inquiry continues very active. Takata & Co., 50 Church Street, have concluded purchases of machinery aggregating \$800,000 for a tube and pipe works in Japan.

The Downey Shipbuilding Corporation, 120 Broadway, New York, has concluded arrangements for the acquisition of the structural steel and iron works of Milliken Brothers, Inc., Milliken, Staten Island. The company has a contract for the construction of 10 standardized type, 7500-ton steel steamships, and will make extensive additions and improvements in the plant for shipbuilding operations. The work will include the installation of shipbuilding berths, construction of which has been commenced. Plans for a group of six new machine shops and construction buildings are now being prepared by the engineering department of Milliken Brothers, 111 Broadway. Wallace Downey is president. The company has an authorized capital of \$10,000,000.

The Miller-Morris Corporation, New York, has been incorporated with an active capital of \$52,500, to manufacture automobile carburetors and kindred specialties. G. Miller, T. A. Morris and H. C. Harris, 51 Chambers Street, are the incorporators.

The Hourwich Aircraft Corporation, New York, has been incorporated with a capital of \$50,000 to manufacture aeroplanes and other aircraft, engines and accessories. I. A. and I. Hourwich and F. Reyher, 17 Christopher Street, are the incorporators.

The Gorham Co., Fifth Avenue and Thirty-sixth Street, silversmith and manufacturer of architectural bronzes, has

leased property at 140-142 Sixth Avenue, near Eleventh Street, for a new manufacturing plant. Improvements costing \$25,000 will be made to the building.

The National Water Motor Corporation, New York, has been incorporated with a capital of \$250,000 to manufacture water motors. F. E. Sturgis, R. Sherman and R. W. Evans, 14 Wall Street, are the incorporators.

The Imperial Machine & Foundry Corporation, New York, has been incorporated with capital of \$300,000, to manufacture machinery, metals, etc. H. Robinson, J. G. and R. A. Abramson, 60 Church Street, are the incorporators.

The J. J. Crawford Co., West New Brighton, Staten Island, has been incorporated with a capital of \$10,000, to manufacture shock absorbers for automobiles. J. J. Crawford, W. Johnson and B. E. Lyons, West New Brighton, are the incorporators.

F. W. Jesup & Co., New York, have been incorporated with a capital of \$10,000 to manufacture agricultural equipment, harrows, plows, etc. F. W. and A. S. Jesup, 416 Macon Street, Brooklyn, are the principal incorporators.

The Ludlam Steel & Spring Co., Fifth Street, Watervliet, N. Y., manufacturer of crucible cast steel specialties, has had plans prepared for a two-story addition. Edward Cornin is president.

Pass & Seymour, Inc., Solvay, N. Y., manufacturer of electrical specialties, is making rapid progress in the erection of a three-story and basement addition to its plant, providing about 60,000 sq. ft. of floor space, which with equipment will cost in the neighborhood of \$100,000. It is expected to be ready for occupancy early in the fall.

The Auto Ride Easy Co., Jamestown, N. Y., has been incorporated with a capital of \$10,000 to manufacture shock absorbers and automobile specialties. A. I. Nordstrom, H. A. Sandberg and A. I. E. Kettle are the incorporators.

The Newton Falls Paper Co., Newton Falls, N. Y., will build a new hydroelectric power plant to cost about \$50,000. Charles E. Easton, Sherman Building, Watertown, is the engineer.

The M. L. Oberdorfer Brass Co., East Water Street, Syracuse, N. Y., manufacturer of brass and aluminum castings, has filed plans for alterations and improvements in its plant.

The Perfect Fuse Co., Buffalo, N. Y., has increased its capital from \$10,000 to \$100,000.

The Smith Elevator Co., Buffalo, N. Y., has been incorporated with a capital of \$75,000 to manufacture elevators and hoisting machinery. C. W. and M. E. Smith and G. E. Burford are the incorporators.

The Seneca Rubber Co., Buffalo, N. Y., has been incorporated with a capital of \$50,000 to manufacture rubber products. H. T. Auerbach, H. A. Forbes and L. B. Dietz are the incorporators.

The Hall Printing Press Co., Dunellen, N. J., manufacturer of printing machinery, has completed plans for a one-story foundry addition, 60 x 100 ft.

The Stableford Truck Sales Co., Plainfield, N. J., has been incorporated with a capital of \$125,000 to manufacture motor trucks and other vehicles. Frank T. and Marcus L. Clawson, Plainfield, and Neil W. Benedict, Newark, are the incorporators.

The Borough Council, Pompton Lakes, N. J., has approved the acquirement of a site on Pompton Lake for the installation of a hydroelectric power plant for municipal service, estimated to cost about \$35,000.

The Hall Switch & Signal Co., Garwood, N. J., has had plans prepared for a one-story extension to its plant on Centre Street, about 40 x 100 ft. H. W. Wolff is general superintendent.

The Grant Hammond Arms Co., Jersey City, N. J., has been incorporated with a capital of \$100,000 to manufacture firearms. Arthur W. Britton, Samuel B. Howard and Harry B. Davis, 65 Cedar Street, New York, are the incorporators.

The Magnolia Novelty Co., Rahway, N. J., has been incorporated with a capital of \$125,000 to manufacture unbreakable metallic toys and has acquired a factory on Campbell Street, near Elm Avenue, for its initial plant. Frank C. Engelhart, Rahway; J. Louis Cisneros, Cranford, and Charles C. Francis, New York, are the incorporators.

The Aeromarine Plane & Motor Co., East Keyport, N. J., manufacturer of aircraft, is planning for the erection of an addition to its plant. It has acquired property on Manchester Avenue, pending the proposed extension.

Cole & Morgan, Inc., Caldwell, N. J., has been incorporated to manufacture electrical equipment. Arthur B. and E. M. Cole, and Alfred P. Morgan, Caldwell, are the incorporators.

The International Arms & Fuse Co., Bloomfield Avenue,

Bloomfield, N. J., will build an extension to its plant to cost about \$4,000.

The Edison Storage Battery Co., Bloomfield, N. J., has taken out a permit to build an addition to its plant in the Silver Lake section.

The Upson-Walton Co., 462 Riverside Avenue, Newark, N. J., manufacturer of wire rope, will build a one-story addition, 30 x 66 ft., to cost about \$4,000.

A. C. Belknap, Inc., Newark, has been incorporated with a capital of \$100,000 to manufacture engines, automobile parts, etc. A. C. Belknap, East Orange; Frank Van Syckle and Harold Van Syckle, Perth Amboy, are the incorporators.

The High Power Piston Ring Corporation, Newark, has been incorporated with a capital of \$50,000 to manufacture piston rings and similar products. Philip J. Schotland, 9 Clinton Street, is the principal incorporator.

The Heller Brothers Co., 879 Mt. Prospect Avenue, Newark, manufacturer of files, will make improvements and extensions to its plant at 231 Verona Avenue to cost about \$3,500.

The Smith-Wilde Mfg. Co., Newark, has been organized to manufacture automobile accessories. Winton L. Smith, 70 Freeman Avenue, East Orange, and Alexander Wilde, 141 Linden Avenue, Arlington, head the company.

The Western Aero Corporation, Newark, has been incorporated with a capital of \$250,000 to manufacture aeroplanes, engines, etc. C. W. Johnson, Jersey City; G. A. Eckhardt, Newark, and J. W. Eckhardt, Orange, are the incorporators.

The West New York Tool & Machine Co., Newark, has been incorporated with a capital of \$15,000 to operate a local plant. A. F. Wagner, Newark; Alois Seybo, West New York, N. J., and E. Kolken, Orange, are the incorporators.

The David Machine & Motor Co., Newark, has been incorporated with a capital of \$125,000 to manufacture machinery. David Davis and Edwin C. Goodwin, Newark, are the incorporators.

Durand & Co., 49 Franklin Street, Newark, manufacturing jewelers, have increased their capital from \$150,000 to \$400,000.

The Porter-Cable Machine Co., Walter A. Ridings, manager, 501 East Water Street, Syracuse, is having plans prepared for a factory, 150 x 200 ft., one story, to be erected at DeWitt, N. Y., at an estimated cost of \$35,000.

The General Optical Co., 538 First Avenue, New York, will erect a three-story addition to its factory at Mt. Vernon, N. Y.

The Rochester Can Co., Rochester, N. Y., is building a two-story addition, 91 x 130 ft., to its factory.

The Sanford Motor Truck Co., Syracuse, N. Y., has completed plans for additions to be made to its plant on West Fayette Street. It manufactures motor trucks of 1 to 5-ton capacity.

The Gleason Works, Rochester, N. Y., manufacturer of gear planers, is having plans revised and will probably take new bids for its projected one-story addition, 120 x 350 ft., on University Avenue.

The George Schautz Engineering Co., Ellicott Square Building, Buffalo, has recently been incorporated with a capitalization of \$30,000 to manufacture cranes and to engage in a general engineering and construction business. George and J. A. Schautz and J. Leuthner are the incorporators.

New England

Boston, July 23.

The local machinery market is being thoroughly combed in an endeavor to obtain machine tools for export. One inquiry for 60 42-in. lathes for Italy, to be used in turning 6-in. guns, is reported as an order to replace a similar shipment which fell a victim to a U-boat. Another fairly large inquiry is for Calcutta, India. The Fore River Shipbuilding Corporation is still buying extensively and the Newport Torpedo Station is another active buyer. With the exception of one local machine shop which is making an unusual success in building machine tools and special machinery on contract, the New England machine tool builders are adding but little to their equipment. Orders from New York and other sections are keeping all the machine tool plants from gaining on their deliveries, but the labor situation is such that little expansion of plants is being undertaken or contemplated.

Small sizes of universal grinders are a little easier to obtain but deliveries of plain and universal milling machines show no improvement. There is little demand for 18-in. and 20-in. lathes, and these sizes can be secured quite promptly.

The call for large sizes for gun work is unabated and deliveries are far into the future. A dropping off in the orders for 22, 24 and 28-in. upright drill presses has made deliveries a little easier. Deliveries on these larger sizes are not better than 10 to 12 months, a recent sale of 5 machines to the Watertown Arsenal calling for delivery in eight months. Universal horizontal boring machines cannot be obtained under five to six months. Dates for deliveries of small automatics continue far off, but large automatics can be bought for shipment in two months.

Sales of second-hand machine tools in reasonably good condition are a prominent factor in the local market, as many machine shops have found it true economy to buy such tools and rebuild them in their own plants to fit their needs. The continuing advances in the prices of new tools is an added incentive to buy second-hand tools.

The Standard Brass & Copper Co., New London, Conn., has increased its capital stock from \$35,300 to \$50,300.

The B. & B. Iron Works, Inc., Boston, has been incorporated with authorized capital stock of \$10,000. The directors are John F. Sutherland, president and treasurer; C. M. Sawyer and E. E. Mullen.

The Blevney Machine Co., Boston, has been incorporated with authorized capital stock of \$300,000. The directors are George J. Ganer, president; Thomas Brennan, 47 West Cedar Street, treasurer; and William R. Scarrett, Jr.

The International Tool & Gauge Co., Bridgeport, Conn., has been incorporated with authorized capital stock of \$10,000 by John A. Wahberg, Bennie Svetkey, Frank B. Carlson, Claus A. Palmquist and Charles J. Borg.

The Framingham Machine Works, Framingham, Mass., is raising the height of its foundry and building a cupola house 20 x 40 ft.

The New Haven Rivet Co., New Haven, Conn., has been incorporated with capital stock of \$5,000 to manufacture hardware and electrical supplies. Henry C. Smith is president and Frank S. Day secretary and treasurer.

The Hubbard Machine Co., Worcester, Mass., has been incorporated with authorized capital stock of \$25,000 to operate a foundry and machine shop. F. C. Smith, Jr., is president and Chester E. Williams treasurer.

The Dauntless Shipyard, Inc., Essex, Conn., has been incorporated with authorized capital stock of \$50,000 by Charles A. Goodwin, George H. Day and Ida M. Topliff.

The Hudson Machine Screw Co., Hudson, Mass., has been incorporated with authorized capital stock of \$15,000. The directors are A. H. MacBriar, president; Harry C. Moore, treasurer; and M. H. Litchfield.

The Superior Mfg. Co., Gloucester, Mass., has been incorporated with authorized capital stock of \$60,000, to manufacture machines, tools and hardware. The directors are Benjamin A. Smith, president; Thomas P. Bolger, treasurer; and F. H. Tarr.

The United Lined Tube & Valve Co., Boston, has been incorporated with authorized capital stock of \$100,000. The directors are D. William Wade, 162 Congress Street, Boston, president and treasurer; M. S. Coggan and J. W. Troy.

Philadelphia

PHILADELPHIA, July 23.

The Baldwin Locomotive Works, Philadelphia, has filed plans for the erection of an addition to its works at Seventeenth and Buttonwood streets.

The Pennsylvania Shipbuilding Co., Land Title Building, Philadelphia, is planning for the early construction of a new machine shop and boiler works at its shipbuilding plant at Gloucester City, N. J.

The Paul M. Evans Co., Philadelphia, has been incorporated with a capital of \$25,000 to manufacture electric storage batteries. S. H. Evans is treasurer.

The Midvale Steel Co., Widener Building, Philadelphia, is taking bids for the construction of its new two-story pattern shop, 46 x 130 ft., at the Nicetown works. A cooling tower, about 30 x 30 ft., will also be erected.

The Chester Shipbuilding Co., Chester, Pa., will build two new shipways at its Chester works and 12 at the proposed shipbuilding plant at Bristol, where it has a large frontage on the Delaware River and plans for the construction of an extensive plant.

The Delion Tire & Rubber Co., East State Street, Trenton, N. J., has taken bids for the erection of a two-story addition to its plant, 65 x 250 ft., to cost about \$70,000. J. Osborne Hunt, 114 North Montgomery Street, is the architect.

Luria Brothers & Co., Lebanon, Pa., operating a plant

for handling scrap iron and steel, have awarded contract for the erection of a two-story addition, about 27 x 35 ft.

The New Jersey Zinc Co., Palmerton, is having plans prepared for the erection of a three-story addition, 60 x 130 ft. Donn & Deming, 808 Seventeenth Street, Baltimore, are the architects. The headquarters of the company are at 55 Wall Street, New York.

Quakertown, Pa., has approved a bond issue of \$45,000 for the installation of new equipment and improvements at the municipal electric power plant.

Lloyd Wells, Royersford, Pa., is having plans prepared for the construction of a one-story addition to his foundry. Arthur Kepner, Pottstown, is the architect.

The Traylor Shipbuilding Co., Allentown, Pa., affiliated with the Traylor Engineering & Mfg. Co., Allentown, will build 10 shipbuilding cradles at its new works at Cornwells. The company recently acquired the plant of the Enterprise Mfg. Co. for its proposed shipyards. Samuel W. Traylor is president.

Fire, July 13, destroyed one of the buildings of the plant of the Emerson-Brantingham Co., Waynesboro, Pa., manufacturer of traction engines, threshing machinery, etc., with loss estimated at \$75,000.

The Barrett & Haentjens Co., Hazleton, Pa., has been consolidated with the Benjamin Iron & Steel Co., of that city, a subsidiary of the Pennsylvania Stripping, Quarrying & Contracting Co. The merger is to perfect arrangements for the manufacture of patented iron and steel specialties of the two companies, for mining, breaker and quarrying service.

The Electric Hose & Rubber Co., Eleventh and Dure streets, Wilmington, Del., is having plans prepared for extensions to its plant. Brown & Whiteside, Wilmington, are the architects.

Chicago

CHICAGO, July 23.

The action July 19 of Col. A. D. Kniskern, head of the quartermaster depot, 115 East Ontario Street, Chicago, Central Department, U. S. A., in placing orders for motor trucks and motor cycles valued at approximately \$33,000,000, will be good news to the machine tool trade, inasmuch as several manufacturers of trucks issued lists against which, it was understood, orders would be placed provided they obtained contracts. The orders call for between 10,000 and 11,000 motor trucks to cost between \$2,500 and \$4,000 each, and 5000 to 5500 motor cycles, costing from \$150 to \$200 each, the aggregate being the largest ever placed at one time by the Government for motor vehicles. Deliveries are to begin immediately, continuing until the last of the year, and orders were distributed among factories all over the United States. Two Western companies reported to have received orders are the Four Wheel Drive Auto Co., Clintonville, Wis., and the Nash Motors Co., Kenosha, Wis.

Requirements of the large arsenal buildings being constructed at the Rock Island Arsenal are fast developing. One of these is being erected by Westinghouse Church Kerr & Co., and one by Stone & Webster. The local machinery trade is in more or less uncertainty as to where orders for the large amount of equipment needed will be placed. Some rumors are that the buying will be done in New York and Boston, while others indicate that the business will be placed at Washington. A representative of Stone & Webster is quoted as saying that while his firm had asked for quotations, the orders would be placed at Washington.

Good-sized inquiries have been received from manufacturers of agricultural implements, and the opinion is quite freely expressed that renewed activity on a large scale is near. The volume of small and miscellaneous buying has contracted considerably in the past week or 10 days, although a good demand is noted for large machines, new or second-hand. How far Government buying, which must be given precedence, will postpone deliveries to private buyers is one of the problems before the trade. All depends on the promptness with which Government orders must be filled. Some tool builders are not anxious at present for more orders from any direction.

The tool trade is interested in the report that the Baldwin Locomotive Works, Philadelphia, will build a large plant in East Chicago, Ill., where for some years it has owned acreage. Some time ago the company contemplated erecting a plant on the site.

Bids have been taken on a one-story machine and forge shop, 130 x 147 ft., in Kedzie Avenue, Chicago, for the Octigan Drop Forge Co., 2430 Lowe Avenue. T. P. Octigan is president.

The plant of the Union Molding Co., 2544 South Western Avenue, Chicago, which was destroyed by fire July 9, will be

rebuilt. D. C. Marggraff, 1728 West Twenty-first Place, is president.

Plans have been prepared for a two-story reinforced concrete boiler and engine house, 30 x 128 ft., to cost \$20,000, and a one-story addition to a roundhouse and coal chute to cost \$38,000, for the Illinois Central Railroad, Clinton, Ill. D. F. McLaughlin and A. S. Baldwin, respectively, are architect and chief engineer.

The World Phonograph Co. has leased a five-story and basement factory, containing 35,000 sq. ft., at 736 and 738 Tilden Street, Chicago, for the manufacture of talking machines.

The Eastern Metal Refining Co. has leased about 80,000 sq. ft. in Fortieth Street, between Fifth and Princeton avenues, Chicago, and will make alterations and build a smelter to cost about \$20,000.

Contract has been awarded to N. Wiltamuth for a two-story factory building at Grinnell, Iowa, for the Dodge Tool Co.

Baltimore

BALTIMORE, Md., July 23.

Sites in this vicinity are being considered by Government officials for the establishment of shipyards to be built under the supervision of the Emergency Fleet Corporation. Representatives have been in communication with waterfront property owners and it is understood that reports will be made to officials within the next few days. The Factory Site Commission, City Hall, is taking an active part in a search for a suitable location. A tract of about 1500 acres of land on Marley Creek, Anne Arundel County, is attracting considerable attention, as it has been rumored that it will be the site of an immense shipbuilding plant in the near future.

The Baltimore Buggy Top Co., 107-113 West Mount Royal Avenue, Baltimore, is receiving bids on the construction of a four-story, 75 x 100-ft. factory at Calvert Street and Mount Royal Avenue.

The Chesapeake Shipbuilding Co., 607 Calvert Building, Baltimore, has been incorporated with \$100,000 capital stock. The incorporators are Sheldon H. Tolles, King Tolles and Roger C. Hyatt.

Goucher College, St. Paul and Twenty-third streets, Baltimore, will build a one-story brick and concrete powerhouse, 40 x 64 ft. Ellicott & Emmart, 1102 Union Trust Building, are the architects.

It has been announced that all private contracts held by the Sun Shipbuilding Co., Chester, Pa., will be dropped and the plant used for the construction of vessels for the Government only.

The Howard Refractories Co., Dorsey, Md., is having plans prepared for two new additions to its works. Sparklin & Childs, Law Building, Baltimore, are the architects.

The Bureau of Yards and Docks, Washington, D. C., has awarded a contract for the construction of a new experimental and research plant for aeronautics at Hampton, Va., to include machine shop, instrument building, pattern shop and other structures. The J. G. White Engineering Corporation, 43 Exchange Place, New York, has the contract.

The Reliance Electric Co., Norfolk, Va., has been incorporated with a capital of \$50,000 to manufacture electric fixtures. F. W. Sharp and W. J. Cannon are the principal incorporators.

Milwaukee

MILWAUKEE, Wis., July 24.

Probably at no time in the history of the metal-working industry of Milwaukee and vicinity has so much activity been evident as now. The placing of Government contracts has been accompanied by a wide demand for machine tools of all kinds, and during the past week this demand has amounted practically to a scramble. Tool builders, especially of milling machines, who now are working to the fullest capacity to make delivery of Federal contracts, or orders which virtually amount to Government business, within the time limits specified, have been overwhelmed with new business. In the face of probably the most extraordinary demand for tools which has been known, greater even than during the earlier days of the European war, private interests are bidding for machines in a measure rarely known. A feature of the situation is the incorporation of many new concerns to engage in some division of the metal-

working industry. The establishment of new works doubtless will bring a heavy draft upon tool builders, who for this reason can see no relief from the immediate high-pressure conditions for a long time ahead, regardless of the duration of the war. The mobilization of State troops and the prospective withdrawal of a considerable number of men by reason of the selective draft is creating even more stringent conditions in the labor market than have been evident for some time past. It has been found that many men who would have a just claim for exemption on occupational grounds have demanded that they be permitted to go into active service.

The Lipman Refrigerator Car & Mfg. Co., Beloit, Wis., has purchased a site, containing 25 acres, on Rock River at Shirland Avenue, for its proposed new refrigerator car and installation plant, the first unit to cost \$100,000 and consist of a machine-shop, tool-room, iron foundry, sheet metal shop, welding shop, wood-working plant and two-track car shed, 200 ft. long. Contracts will be awarded within a few days. The Lipman company is capitalized at \$500,000 and its officers are: President, Carl E. Lipman, Beloit; vice-president, E. L. von Suessmilch, Delavan, Wis.; secretary-treasurer, Ernest Lipman. It holds the sole manufacturing rights for the United States and Canada of an automatic brine circulation system of refrigeration and will not only build complete "freezer" rolling stock, but install the system in old cars. Carl E. Lipman also owns the Lipman Mfg. Co., Beloit, maker of air, oil and water compressors and pumps.

The Mitchell Motors Co., Racine, has purchased the plant of the Mitchell Wagon Co., Racine, and will devote it to the manufacture of automobile bodies and coach work. The stock of materials, patents, trade-marks, patterns and goodwill of the wagon company have been purchased by Deere & Co., Moline, Ill., who will continue the manufacture of Mitchell standardized wagons at their plant in Fort Smith, Ark.

The Northwestern Battery Co., Milwaukee, has been incorporated with capital stock of \$40,000 to take over the storage battery manufacturing business of the Northwestern Storage Battery Co. and the business of the Willard Battery Service Co., 130 Mason Street, Milwaukee. A three-story factory and office building is being erected for the new company at 530 Jefferson Street and will be ready Aug. 1. Win H. Cameron, Chester B. Pierce and J. H. Gugler are the proprietors.

The Oshkosh Foundry Co., Oshkosh, Wis., has been incorporated with capital stock of \$10,000 by Frank T. Turner, Joseph W. Radl and Hugo M. Stueck.

The Western Metal Specialty Co., Milwaukee, has been organized with capital stock of \$30,000 under the laws of Wisconsin. Louis E. Fichaux, A. U. Stetten and C. H. Benton are incorporators.

The Neenah Brass Works, Neenah, Wis., has awarded contracts for an addition to its foundry and machine-shop, costing about \$20,000.

A report from Oconomowoc, Wis., the seat of one of the largest plants of the Carnation Milk Products Co., Seattle, Wash., says that the company is contemplating the establishment of a factory for the manufacture of tin cans to supply its own requirements. It is stated that the investment will be about \$250,000. Official confirmation of the report is lacking.

The Safety Truck Brake Co., Waukesha, Wis., has been incorporated with capital stock of \$20,000 to manufacture a patented braking system for motor trucks. The incorporators are W. S. Halladay, J. T. Abel and Elmer L. Arnold.

The Wisconsin Gas & Electric Co., Racine, Wis., controlled by the same interests as the Milwaukee Electric Railway & Light Co., a North American subsidiary, has increased its capital stock from \$2,750,000 to \$3,350,000 to accommodate extensions of its power generating and transmission system at Racine and throughout southern Wisconsin. S. B. Way, Milwaukee, is in charge.

The Specialty Brass Co., Kenosha, Wis., has plans for a foundry and shop addition, 40 x 40 ft., one story, of reinforced concrete and brick.

The Wisconsin Tool & Supply Co., Milwaukee, has filed articles of incorporation. The capital stock is \$20,000 and the incorporators are John W. Mapel, John S. Stover and E. B. Arnold.

The Optenberg Iron Works, Sheboygan, Wis., has taken contracts for a 10,000-gal. water softener tank for the University of Wisconsin, Madison, and a 5000-gal. tank for the Mission House at Franklin, Sheboygan County. The Franklin contract includes a 70-hp. engine and two hoisters.

The Nekeosa-Edwards Paper Co., Port Edwards, Wis., has awarded contracts for enlargements and improvements estimated to cost about \$200,000. The work includes, among other buildings, a two-story machine shop, 60 x 80 ft.

The Regal Oil-Gas Burner Co., Milwaukee, has filed articles of incorporation. The capital stock is \$5,000 and the incorporators are O. A. Clark, George P. Noble and W. H. Parish.

The New Way Machinery Co., Eau Claire, Wis., has filed articles of incorporation. The capital stock is \$25,000 and the incorporators are Ernest Wege, O. A. King and Alfred J. Hirtz.

The Goodrich Transit Co., Milwaukee and Chicago, is reported to be seeking a new location for its drydock and machine-shop, now located at Manitowoc, Wis., because of the requirement of the present quarters by the Manitowoc Shipbuilding Co., which is more than doubling the size of its plant to handle Government work. The Manitowoc Chamber of Commerce is at work on a plan to keep the Goodrich yards in that city by providing a new location.

Detroit

DETROIT, July 23.

Improvement was noted in the machine tool market the past week. A number of large orders were received by dealers, and more inquiries came in than have been received for months. Additional strength to the belief that Detroit will become the airplane center of the United States is given by the report of Government officials to the effect that this city will manufacture a large proportion of airplanes for the army. Automobile manufacturers are prepared to turn out air machines in large numbers, and several have developed satisfactory motors.

No improvement is noted in machine tool deliveries. Labor is extremely scarce and well employed. Several hundred more skilled mechanics and more than 1000 unskilled workmen could be placed immediately.

The Michigan Drop Forge Co., Pontiac, Mich., will immediately improve its plant and increase its capacity to handle an additional volume of business. The company makes steel forgings, and has just completed arrangements for increased capital. Paul A. Leidy is secretary and treasurer.

The Continentals Motors Corporation, Detroit, will manufacture trucks as well as passenger car engines, and will provide increased activity.

It is reported that the plant of the Racine Boat Mfg. Co., Muskegon, Mich., sold during bankruptcy, is soon to be remodeled and enlarged for shipbuilding.

The Gorham & Goddard Co., 45 Congress Street West, Detroit, capitalized for \$75,000, has begun the manufacture and salvaging of tools.

The Young High Velocity Carburetor Co., Charlevoix, Mich., has begun the manufacture of automobile supplies. The authorized capital is \$250,000.

The Peerless Foundry Co., Detroit, has been incorporated with a capital stock of \$10,000, to do a general foundry business.

The Saginaw Shipbuilding Co., Saginaw, Mich., has been incorporated with a capital stock of \$350,000, of which \$200,000 has been subscribed. When in full operation, 1000 men will be employed. F. W. Wheeler is president.

The Saginaw Automobile Climb-Put & Shovel Co., Saginaw, has been organized with a capital stock of \$25,000, to manufacture a device for drawing out automobiles and motor trucks when mired. C. N. Albee is general manager.

The Cooley Casting Co., formerly the Roeller Foundry Co., Bay City, Mich., will complete within a few months additions to its plant, consisting of two large buildings and a cupola. The company manufactures iron products, aluminum and brass devices, including parts for automobiles, bushings, etc.

The Olds Motor Works, Lansing, Mich., has let contracts for the erection of factory, 80 x 400 ft., making the second building now under construction. It expects to triple its production.

The Pioneer Trailer Corporation, Detroit, has been incorporated with \$30,000 by W. M. Cornelius, Daniel E. Leiderbrandt and Arthur S. Squires.

The Marble Arms & Mfg. Co., Gladstone, Mich., will erect a plant to manufacture motors and dynamos.

It is announced by J. Elmer Pratt, president, Higrade Motors Co., manufacturer of a $\frac{3}{4}$ -ton truck, that the company will build a factory at Grand Rapids, Mich. It is at present operating a temporary factory at Harbor Springs, Mich., with executive offices in the National City Bank Building, Grand Rapids.

A factory to cost \$100,000 is to be erected in Arcadia, Mich., by the Arcadia Furniture Co., whose plant was recently destroyed by fire.

The Linderman Machine Co., Muskegon, Mich., which has naval ordnance contracts, will soon award contracts for an addition, 100 x 500 ft.

The Detroit Pressed Steel Co., Detroit, is spending about \$200,000 in additions to present buildings to provide for a new tool room, stock room, receiving room and the initial unit for buildings for the manufacture of single disk steel wheels. C. H. L. Flintermann is vice-president and secretary.

Cleveland

CLEVELAND, July 23.

A large volume of business is being placed in machine tool equipment for making airplane motors. The past week, the Packard Motor Car Co., Detroit, and the Willys-Overland Co., Toledo, purchased about \$65,000 worth of machinery for this purpose, orders being placed with a Cleveland dealer. Another inquiry is pending for about \$40,000 worth of machinery for airplane work. A heavy demand is noted for multiple spindle drilling and boring machines for work on airplane motors, and for single spindle high-speed drilling machines for airplane and other Government work. Information comes from Detroit that the General Motors Co. will build a large forge shop in that city as soon as plans can be prepared. This company has an inquiry out for nine 10 to 15-ton electric traveling cranes for the proposed plant, and is expected to require a large amount of forge shop equipment. Detroit machinery dealers are looking here for considerable machinery equipment to supply the demands of automobile plants taking on Government work. The Brier Hill Steel Co., Youngstown, has an inquiry out for about 15 machines, mostly large type. About half of these are lathes, ranging from 16 to 42 in.; the remainder are planing, milling and slotting machines, and a hydraulic wheel press. Inquiry for cranes continues very heavy, the bulk of the demand being from shipyards.

The Peters Machine & Mfg. Co., Cleveland, is erecting an addition, 60 x 136 ft., on Pear Avenue.

The National Tool Co., Cleveland, will enlarge its plant by the erection of a one-story brick factory, 52 x 132 ft.

The Cuyahoga Varnish Co., 8820 Bessemer Avenue, Cleveland, will build a brick and steel addition.

The Massillon Steel Castings Co., Massillon, Ohio, recently incorporated with a capital stock of \$250,000, has elected the following officers: E. H. Birney, president; Fred H. Snyder, vice-president; I. M. Taggart, treasurer; Walter White, secretary; and H. F. Anthony, general manager. The company expects shortly to select a site for a plant.

The Portage Foundry Co., Akron, Ohio, has been incorporated with a capital stock of \$150,000 by S. W. Harris, W. E. Wilson, C. G. Wise and others, to engage in the foundry business.

The Thompson Machine Co., Canton, Ohio, has been organized by W. C. Belden, William Bauman, D. H. Rose and others, to conduct a jobbing machine shop.

The International Tool Co., Warren, Ohio, has been incorporated by D. A. Geiger, C. P. Nye and others. It is primarily a sales organization and will handle tools made in Warren plants.

The Federal Machine & Welder Co., Warren, has been incorporated with a capital stock of \$200,000 by A. Prickman, Ralph S. Lounsbury, R. Klingman and others.

The Buckeye Dryer Co., London, Ohio, has been incorporated with a capital stock of \$30,000 by W. E. Prindle, H. M. Chaney, Thomas Mattinson and others.

The Toledo Machine & Tool Co., Toledo, Ohio, is taking bids for the erection of its new one-story machine shop and foundry, about 158 x 375 ft. Day & Zimmerman, 611 Chestnut Street, Philadelphia, are the engineers.

Cincinnati

CINCINNATI, July 23.

Labor conditions at Hamilton are somewhat improved. Foundrymen at the Niles Tool Works returned on the old basis, with no agreement with the union. Another smaller foundry is also operating, but the basis of settlement is not known. Other idle plants are expected to resume operation in a few days.

Some sizes of lathes can be delivered more promptly, due to a slackening in demand from both domestic and foreign sources. Most firms are sold ahead, however, and are not soliciting business for nearby delivery. Shaping machines are still in good demand, mostly from concerns having die and tool work, which is now very plentiful, but also from repair shops. Second-hand machine tools are more plentiful. Shipbuilders have lately been buying all kinds of equipment, principally in scattered lots, and are not advertising their wants by sending large lists broadcast.

The Bahmann Iron Works Co., Cincinnati, maker of sugar machinery, will build a one-story brick and steel addition, 60 x 100 ft., to its plant on Spring Grove Avenue.

The Southern Railway Co. states that no immediate plans have been made for enlarging its shops in Ludlow, Ky.

The John B. Morris Foundry Co., Cincinnati, will remodel part of its foundry, installing new lockers for employees, as well as making other changes.

The Sayers & Scoville Co., Cincinnati, has acquired a manufacturing building at Gest Street and the Cincinnati, Hamilton & Dayton Railroad, and will establish an automobile plant at an early date. Particulars are not yet available.

The Sidney Power Press Company, Sidney, Ohio, W. E. Whipp, president, recently organized to build power presses, advises that it is in the market for one each of the following machines:

- 24 in. x 24 in. x 8 ft. planer, or up to 30 in.
- 42 in. either open-side or regular planer, with about 10 or 12 ft. table.
- Sensitive drill.
- Drill press, about 20 in.
- No. 2 universal milling machine.
- No. 3 plain milling machine.
- Large band screw machine for chucking work.
- Hack saw.
- Horizontal boring, milling and drilling machine.
- Vertical boring mill, about 50 in.
- Radial drill, speed box drive, about 2½ ft. or 3 ft.
- Radial drill, speed box drive, about 3 ft., 4 ft. or 5 ft.
- 24-in. back-geared shaper.

The Ram Engineering Co., Columbus, Ohio, recently organized to handle die and tool work, has leased quarters at 95 Gay Street, and will also manufacture a patented lock for automobiles. J. W. Anderson is vice-president and manager.

The Monitor Motor Car Co., Columbus, is preparing to enlarge its plant at Mt. Vernon and Cleveland avenues. F. S. Cummins is president.

The Columbus Lift Truck Company, Columbus, has been incorporated with \$200,000 capital stock by F. H. Angell and others. It formerly operated under a partnership arrangement. It is rumored that a factory will be installed for making a patented lift truck.

Work on the addition to the plant of the Robbins & Myers Co., Springfield, Ohio, is now well under way, and will be ready for equipment before Aug. 15.

The John H. McGowan Co., Cincinnati, pump manufacturer, has received a Government order for vertical simplex pumps to be installed in merchant vessels.

The New World Mfg. Co., 120 West Third Street, Cincinnati, die and tool maker, is planning to increase the capacity of its factory.

The Estate Stove Co., Hamilton, Ohio, has increased its capital stock from \$550,000 to \$825,000, and will enlarge its stove foundry at an early date.

The proposed addition to the plant of the Ohmer Fare Register Co., Dayton, Ohio, will be 90 x 245 ft., two stories, of brick and concrete.

The Pasteur-Chamberland Filter Co., Dayton, has purchased the machinery and plant of the Foote Mfg. Co., and will manufacture electric searchlights for the Government.

The Dayton Handle Co., Dayton, will erect a new plant. Building details are not yet available.

The Blackwood Foundry Co., Springfield, Ohio, has plans under way for an addition to its plant.

The La French Spark Plug Co. has removed its plant from Dayton to First Avenue and High Street, Columbus.

Reese & Strong, Columbus, will make an addition to their gray-iron foundry that will nearly double its present capacity.

The Columbus Anvil & Forging Co., Columbus, has increased its capital stock from \$20,000 to \$60,000. Nothing is known as to plant extensions.

Indianapolis

INDIANAPOLIS, July 23.

The Indiana Truck Co., Marion, Ind., has reduced its capital stock from \$250,000 to \$1,000.

The Logansport Heating Co., Logansport, Ind., has changed its name to the Logansport Heat & Power Co., and has issued \$250,000 of preferred stock.

The main factory building of the Knight-Brinkerhoff Piano Co., Brazil, Ind., has been sold to A. L. Stout of Indianapolis, and will be converted into a furniture factory. Mr. Knight retains the foundry building and ground contiguous, and will remodel the foundry and equip it for the manufacture of a new phonograph.

The Anderson File Co., Anderson, Ind., has been in-

incorporated with \$10,000 capital stock. The directors are F. M. Wilson, S. R. Wilson and C. E. Wilson.

The Crawfordsville Wire & Nail Co., Crawfordsville, Ind., is putting up an addition to its plant, 60 x 200 ft.

The Globe Steel & Range Works, Kokomo, Ind., has obtained a \$55,000 contract for hotel ranges for army cantonments.

The plant of the Indiana Rolling Mill Co., Newcastle, Ind., has been sold to the Galesburg Coulter Disc Co., Galesburg, Ill. The shovel plant was included in the deal. The business will be continued at Newcastle.

The Hayes Wheel Works Co., Anderson, Ind., is enlarging its plant.

The Central South

LOUISVILLE, KY., July 23.

Miscellaneous equipment for manufacturing plants is in demand, with a shortage of materials for oil well operations. The labor situation is becoming increasingly difficult and Louisville manufacturers are employing women workers in numerous instances.

The Roy C. Whayne Supply Co., Louisville, is in the market for a locomotive crane, two or more traveling cranes, steam or electric, to handle 1 1/4 cu. yd. to 1 1/2 cu. yd. orange peel buckets at 25 ft. Also two stiff leg traveling derricks, 75-ft. boom, capable of operating a 4-cu. yd. clam shell bucket; two 1 1/4 or 1 1/2-yd. orange peel buckets, and two 4-cu. yd. clam shell buckets.

Fire destroyed the plant of the Hardy Buggy Co., Paducah, Ky., with a loss of \$50,000 to equipment and contents, exclusive of the buildings. W. T. Hardy is president.

The Union Motor Co., Lexington, Ky., has been incorporated, with capital stock of \$25,000, by C. H. Berryman, H. R. McEldowney and R. F. McEldowney.

The Dixie Foundry Co., Cleveland, Tenn., has been incorporated with capital stock of \$40,000 by S. B. Rymer, J. P. O'Neill, J. S. O'Neal, P. B. Mayfield and Charles S. Mayfield.

Birmingham

BIRMINGHAM, ALA., July 23.

The Kilby Frog & Switch Co., Birmingham, will add to its capacity for frogs and switches by new construction involving \$40,000.

The Tampa Dock Co., Tampa, Fla., capital stock \$1,000,000, will build yards to construct wooden ships and probably steel ships later.

The Dantzler Shipbuilding & Dry Docks Co., Moss Point, Miss., capital stock \$100,000, will build yards to construct wooden ships. A. F. Dantzler, Moss Point, Miss., and G. B. Dantzler, Gulfport, Miss., are interested.

St. Louis

ST. LOUIS, July 23.

Little if any increase was noted in the machine tool transactions the past week, the tendency still being to go slow during the readjustment period. This might as well be the case, since deliveries are now in such a condition as to make contracts for equipment a doubtful matter so far as availability of the machinery is concerned. Such demand as is developing in this section for equipment for war manufactures is for general machinery, and not machine tools. Ammunition-making machinery is not in special call, though there are a number of plants engaged in such manufacture. Electric equipment is in some demand, and pressure is still being felt here from the call for shipbuilding machinery at other points. Collections are reported very good, and both loan and investment funds are reasonably available.

The News Vending Machine Co., Kansas City, Mo., has been incorporated with a capital stock of \$20,000, by Edward Richards, Thomas H. Payne and James S. Summers, to manufacture vending machines.

The Pine Bluff Compress & Warehouse Co., Pine Bluff, Ark., has increased its capital stock from \$65,000 to \$120,000, and will increase its plant equipment.

The Citizens Ice & Cold Storage Co., Little Rock, Ark., C. M. Conway, Texarkana, president, has acquired the Little Rock Ice Co.'s plant, and will expend \$100,000 on remodeling and re-equipping it as a re-icing and cold storage plant.

The Jonesville Lumber & Veneer Co., Jonesville, La., will build a hardwood mill with a daily capacity of 40,000 ft. A. W. Stewart is president.

The Chicago, Rock Island & Pacific Railway will erect a coaling station at Trenton, Mo., and install mechanical load-

ing apparatus. C. A. Morse, chief engineer, Chicago, is in charge.

The Quick Ice Making Machine & Mfg. Co., Lake Charles, La., has been incorporated with a capital stock of \$40,000 by W. C. Grant, president, Abilene, Tex., and others, and will equip a machinery manufacturing plant. Frank M. Terrell, Lake Charles, is treasurer.

The Appalachian Corporation, Atlanta, Ga., which has acquired the Brooklyn Cooperage Co.'s plant at New Orleans, La., will remodel at an expense of \$900,000, of which \$200,000 will be expended for cold storage machinery.

Texas

AUSTIN, TEXAS, July 21.

As a result of the great increase of acreage of peanuts and the large demand for peanut oil and similar products, many plants are being installed to manufacture peanut oil, cake and meal. There is also an increase in the demand for cottonseed oil mill machinery. Crop conditions generally over the State continue very satisfactory.

The National Hydro-Electric & Conservation Co., which is constructing a hydro-electric plant, recently submitted an offer, through its president, C. H. Alexander, to the city commission of Dallas to supply that city with 20,000 continuous horsepower of electrical energy at 1 cent per kilowatt hour for a period of thirty years. The plant will be ready for operation in about eighteen months. The company expects to develop about 40,000 horsepower, which will be distributed to cities and towns within a radius of more than two hundred miles.

The Texas Saw Works Co. will build a plant at Beaumont for the manufacture of saws. A. T. Chenault is interested.

The Beaumont Shipbuilding & Dry Dock Co., Beaumont, has been incorporated with capital stock of \$300,000, to build and operate shipbuilding yards. S. A. Mageath of New York, John H. Kirby and B. F. Bonner of Houston are largely interested.

California

SAN FRANCISCO, July 17.

The demand for most lines is good, and for some it is extremely active. Deliveries continue uncertain, causing considerable complaint. Last week local manufacturers notified customers of an average advance of 10 per cent on small tools, but this has not deterred buyers from placing orders, which just now are unusually heavy.

The War and Navy departments are in the market constantly for material and equipment, and Government buyers are accepting the changed condition regarding values. On July 13 the Navy Department opened bids and awarded a contract for \$31,000 for lathes, for the Mare Island Navy Yard, to Pratt & Whitney of this city. Other Government orders placed here include a number of caterpillar tractors, to be made by the Holt Mfg. Co., Stockton, Cal., for delivery in the Hawaiian Islands; and a rush order of airplane motors, to be made at the Berkeley factory of the Hall-Scott Motor Car Co.

The Byron Jackson Iron Works, Sharon Building, San Francisco, has awarded a contract for a one-story machine shop at Berkeley, at a cost of \$33,750. It is now filling a Government order for 12 5- and 6-in. centrifugal heavy duty pumps for use at Eastern cantonments.

The East Bay Water Co., Oakland, is building machine, blacksmith and carpenter shops and pipe fitting rooms at Twenty-second and Adeline streets, at a cost of \$12,000.

The Western Pipe & Steel Co. of California will increase its capital stock by \$63,000.

The Dow Pump & Diesel Engine Co., San Francisco, has received an initial order for 300 marine pumps from the United States Emergency Shipping Corporation for use on the first unit of the merchant squadron.

Plans are being drawn for an addition, 100 x 200 ft., to the main factory of the International Harvester Co., Fifteenth Street and Potrero Avenue, San Francisco.

The Holt Mfg. Co., Stockton, has begun the manufacture of a caterpillar combined harvester. It is strictly self-contained, being self-propelled and furnishing power for all the operations usually performed by a combined harvester.

The Union Construction Co., Oakland, Cal., has asked the Oakland authorities for a lease on a 25-acre site on the Oakland water front, on which to establish a shipbuilding plant. An ordinance providing for the lease has been drawn up.

The Western Screw & Lock Nut Co., San Francisco, is installing a factory at 1401 Folsom Street.

The Los Angeles Shipbuilding & Dry Dock Co., Los Angeles, which has contracts for eight steel steamers for the

Emergency Fleet, has begun the construction of a machine shop and compressor building.

The Lillie-Fletcher Co., Los Angeles, has applied for a lease on a five-acre shipbuilding site on Wilmington basin, near Los Angeles.

Charles V. Crellin, Los Angeles, has let a contract for a brick machine shop to cost \$3,818.

The Cutter Laboratory, Inc., Berkeley, has bought 15 acres, and will erect additional factory buildings.

It is reported that the Union Iron Works, Alameda, Cal., will install a gas system of rivet heating in its plant.

The Llewellyn Iron Works, 1100-1218 North Main Street, Los Angeles, manufacturer of elevators, tanks and structural steel, has filed plans for the construction of a shop addition, 50 x 100 ft., and a power house, about 35 x 80 ft.

The Pacific Refractories Co., Los Angeles, has been incorporated with a capital of \$50,000 to operate a local plant. C. W. Hill, John C. Thomas, W. L. Hardin, O. C. Kingsley and J. H. McKnight, all of Los Angeles, are the incorporators.

The Dauch Mfg. Co., Sandusky, Ohio, manufacturer of tractors, trucks, motors, engines, etc., has been incorporated to operate at Los Angeles and other sections of California. J. J. Dauch, president, Hinde & Dauch Paper Co., Sandusky, heads the company.

W. E. Hampton, 1106 Trust & Savings Building, Los Angeles, will construct a plant, 60 x 120 ft., at 602 South Mateo Street, for galvanized metal specialties. It will cost about \$5,000.

C. E. Fulton, Los Angeles Harbor, San Pedro, operating a local shipbuilding plant on Mormon Island, has incorporated the Fulton Shipbuilding Co., with capital of \$100,000. C. E. and M. S. Fulton, E. H., G. L. and J. E. Seaver, Los Angeles, are the incorporators. The company recently received a contract for the construction of four vessels.

The Pacific Northwest

SEATTLE, July 17.

Labor conditions present the most serious problems in the manufacturing and lumber industries in the Northwest at the present time. Shingle manufacturers of western Washington are facing a strike for eight-hour day, and both sides have refused to arbitrate. Sixteen logging camps in the Grays Harbor district are closed down, and more than 1600 men are out on strike. Conditions now point to a general strike and complete tie-up of the mills in that section.

Statistics for the water-borne commerce of the Seattle port for the month of June show a gain of more than \$10,000,000, compared with the previous record month. The June total was \$58,306,650, a daily average of \$1,943,555.

Recent figures show that Seattle has been awarded more contracts for construction of steel ships for the Government than any other city in the United States. Of the thirty-four contracts let on the Pacific coast for steel ships, Seattle concerns have been awarded sixteen. Eighteen months ago, Seattle had one steel shipbuilding plant, employing less than 1,000 men. There are now four plants, constructing steel vessels, with working forces of more than 10,000 men. At present, two new plants are being built, and four or five wooden shipbuilding plants are being equipped and preparing to lay keels for the Government or on private account within the next thirty days. The city of Portland has three modern steel shipbuilding plants, which will be used for Government ship construction. Portland firms now hold contracts for 38 wooden vessels.

The Tacoma Shipbuilding Co., Tacoma, Wash., has received a contract for four vessels for the United States emergency fleet.

The Seattle Machine Works, Seattle, have taken out a permit for a one-story machine shop, 70 x 200 ft., costing \$14,000. The shop will be equipped with new machinery.

The Canadian Northern Railway Co.'s car shops at Port Mann, B. C., are being rapidly prepared for operation, and the work of installing machinery is being rushed. The company will generate its own electricity to operate the plant and light the shops.

A sawmill with a capacity of 50,000 ft. daily will be built near Newport, Wash., by the Summers Brothers Match Co., Saginaw, Mich.

The Pacific Marine Iron Works, Seattle, will have its new plant in operation within 60 days. Triple-expansion engines for the standard type of Government wooden steamers and Ballin watertube boilers will be built. The company now holds contracts for the construction of 50 boilers, costing \$15,000 each, and for sixteen engines, costing \$15,000, for a shipbuilding plant in Portland.

Wynkoop Brothers, Portland, will immediately rebuild

their plant, recently destroyed by fire. They now have contracts for 70 metal lifeboats.

Charles Hall, North Bend, Ore., is at the head of a company which will immediately equip a shipbuilding plant at North Bend, Ore. The company has contracts for several vessels.

The Eagle Brass Foundry, Seattle, has let a contract for a factory building, two stories, 90 x 105 ft., costing \$10,000.

The Thomas Paper & Pulp Co., Centralia, Wash., has purchased 300 acres of coal land, to supply fuel for a power plant to be built in Centralia. The company plans to erect a big paper mill in Aberdeen, Wash., to manufacture paper from red fir by a new process.

The Motorship Construction Co., Vancouver, Wash., has secured contracts for 60 lifeboats, each 24 ft. long, to equip various Government vessels now under construction on the Columbia River.

The Empire Copper Co., Mackay, Idaho, has awarded to the American Steel & Wire Co. a contract for an aerial tramway, 16,300 ft. long, costing \$80,000.

The Griswold-O'Donnell Co., Portland, will construct a shipbuilding plant at Vancouver, Wash., with four ways. The company will handle both Government and private work.

The Columbia River Shipbuilding Corporation, Portland, Ore., has received contracts for the construction of several steel vessels for the French Government.

The Northern Pacific Railway Co. has completed at Tacoma, Wash., a plant to reclaim all the waste in the division west of Paradise. The plant cost \$50,000 to \$60,000, and includes a rolling mill, forging shop, and machine shops.

The Elliott Bay Shipbuilding Co., Seattle, has received contracts for four auxiliary schooners, to cost \$1,400,000. Work on them will begin at once at the Seattle plant of the company.

The Star Machinery Co., Seattle, will erect a three-story addition to its plant, at a cost of \$20,000. The machine shop will be newly equipped, and will occupy the first floor.

P. J. Stone, William Leyhold, K. B. Kellogg and others, Tacoma, Wash., will construct a sawmill on the waterfront to manufacture ship materials. The plant will have a capacity of 50,000 ft. daily, and will be equipped to cut timber 120 ft. long. The company will have capital of \$25,000.

J. F. Duthie & Co., shipbuilders, Seattle, Wash., have received a contract from the French Government for two 8800-ton steel steamships to cost about \$3,500,000. The vessels will be powered with 3000-hp. turbine engines.

The Portland yards of the Foundation Co. of New York will build 20' wooden vessels for the French Government, half of the contract recently awarded. The Foundation Co. will immediately construct a shipyard with ten ways at Portland.

L. H. Gray, vice-president and treasurer of the Anderson Shipbuilding Corporation, Seattle, has retired from that company, and will construct a large shipbuilding plant at Seattle. Eastern capital is associated in the enterprise.

The Oregon Shipbuilding Co. and the Motorship Construction Co., both of Portland, have consolidated, and the latter company's plant at Vancouver will be greatly enlarged. Several new buildings will be constructed at once, and new machinery installed. The two concerns have contracts on hand for 160 lifeboats, costing \$100,000.

Pittsburgh

PITTSBURGH, July 23.

Conditions in the local machinery market are quieter at present than at any time for some months. One reason is that many concerns contemplating building new plants or making additions, for which many machine tools would be needed, are holding off until it is more definitely known what the Government will do in the matter of regulating prices on iron and steel products. Another is that buyers of machine tools feel top prices have been reached, and that by waiting they may be able to buy the tools needed at lower prices. No important lists of machine tools are in this market at present, aside from a new list sent out recently by the Briar Hill Steel Co., Youngstown, Ohio, which has asked for prices on the following tools:

- One 16-in. and one 28-in. shaper.
- One 96-in., 600-ton, hydraulic wheel press.
- One 2-in. single bolt cutter.
- One 16-in., one 20-in., one 30-in., one 36-in. and one 42-in. lathe.
- One No. 3 universal milling machine.
- One 18-in. slotter.
- One 5-ft. open side planer.

The Pennsylvania Lines West are in the market for a fairly large lot of machine tools for its Indianapolis shops.

and the Heppenstall Forge & Knife Co., Pittsburgh, is inquiring for some tools. On large machines, such as planers, boring mills and slotters, most makers are sold up for 18 months to two years, and will accept orders only on condition that prices paid shall be those ruling at the time shipment is made. On some smaller machine tools deliveries can be made promptly from stock. It is stated that machine tools are more active at present in other leading machinery centers than in the Pittsburgh district.

The Service Supply & Equipment Co. of Pittsburgh has changed its name to the Duquesne Electric & Mfg. Co., which has been incorporated with a capital of \$50,000. Its shops are located opposite East Liberty Station and the main offices are in the Bessemer Building. A branch office is located in the Marshall Building, Cleveland. The company rebuilds electrical machinery, motors, generators, locomotives, switchboards, gas engines and steam engines and has a completely equipped shop. It also handles new machinery for immediate delivery. The manufacture of a complete line of railroad switches is contemplated in the near future. D. A. Casey is general manager.

The General Foundry & Mfg. Co., whose plant at Youngstown, Ohio, was recently destroyed by fire, will be rebuilt at once on a larger scale. It manufactures metal specialties and light gray cast iron, and will likely be in the market for considerable equipment. L. J. Mittinger is vice-president.

The Non-Derrick Drilling Machine Co., Pittsburgh, has been incorporated with a capital of \$200,000 to manufacture non-derrick drilling machines. Wilber A. McCloy and others are the incorporators.

The Sanitary Appliance Co., Braddock, Pa., has been incorporated under Delaware laws with capital of \$10,000 to manufacture sanitary food choppers and other specialties. F. R. Pershing and H. F. Leighton, Braddock; and Joseph Helsoner, East Pittsburgh, are the incorporators.

Work on the new shops of the Union Switch & Signal Co., at Swissvale, Pittsburgh, is going on at a rapid rate, and they are expecting to be fully completed early in 1918. It is possible that some departments may be ready for operation by October. The entire plant was not destroyed by fire last winter, and it has been able to fill orders fairly promptly.

Canada

TORONTO, July 23.

The increased demand for steel for the manufacture of munitions places the private consumer in a difficult position, and in order to obtain his requirements he has to pay high prices, reports the Canadian Bank of Commerce. All steel mills continue to be very active. A large number are greatly extending their plants and installing additional equipment in order to meet the present demand, but in most cases the demands are beyond their capacity. Labor troubles are common to all industries, and as a result production in some plants is not up to capacity. This is particularly the case with regard to mining companies. The production of all the Canadian coal fields is much less than normal, and some anxiety exists as to the winter supply at points distant from the mines, where lack of transportation facilities adds to the difficulties of the situation.

The Canadian Engineer & Contracting Co., Hamilton, Ont., is in the market for 15½-yard, 24-in. gage dump cars, also 4000 ft. of light rails.

The St. Maurice Foundries, Ltd., Trois Rivières, Que., has been incorporated with capital stock of \$49,000 by H. G. French, W. J. Miller, P. Dumoulin, and others, to manufacture iron, steel, machinery, etc.

The Chester Basin Shipbuilders, Ltd., Basin, N. S., has been incorporated and proposes to establish a shipbuilding plant at Basin. Howard Oxner is secretary of the company.

The Magnolia Metal Co., 225 St. Ambrose Street, Montreal, Que., is making arrangements for the erection of a plant estimated to cost \$60,000.

Tenders are in for the erection of a \$140,000 plant at Windsor, Ont., for the Maxwell Motor Co., of Detroit.

The International Harvester Co. has awarded a contract for the erection of an iron foundry at Chatham, Ont., at a cost of \$14,000.

Contracts have been awarded in connection with the erection of a \$25,000 addition to the plant of the Hamilton Steel Wheel Co., Hamilton, Ont.

E. Leonard & Sons, York Street, London, Ont., manufacturers of boilers, engines, tools, etc., have awarded a contract in connection with the erection of a \$5,000 addition to their plant.

The Nicu Steel Corporation, Ltd., Toronto, Ont., has been incorporated with capital stock of \$200,000 by Donald R. Hossack, 44 King Street West; Joseph Murrae, Gordon;

Alicia Hill, and others, of Toronto, to build and operate plants for manufacture of steel, iron, machinery, etc.

The New Mfg. Co., Ltd., Ottawa, Ont., has been incorporated with capital stock of \$45,000 by Thomas A. Beament, Alan K. Armstrong, Robert J. Smith, and others, to manufacture heating devices, appliances, instruments, etc.

The General Automobile Equipment, Ltd., Montreal, Que., has been incorporated with capital stock of \$50,000 by Joseph H. Fortier, Quebec, Que.; Henry J. Hummell, Emil Delage, and others, of Montreal, to manufacture motors, automobiles, parts, accessories, etc.

The Canadian Incinerator Co., Ltd., Toronto, Ont., has been incorporated with capital stock of \$50,000 by Samuel Rogers, Henry M. Finkle, Alan G. G. Keith, and others, of Toronto, to manufacture boilers, tanks, engines, incinerators, etc.

Engholm & Partners, Ltd., Toronto, Ont., has been incorporated with capital stock of \$100,000 by Frank G. Engholm, Howard A. Hall, Lilian M. Heal, and others, to carry on the business of structural, civil and mechanical engineers, and to build hydraulic and electric plants.

The Dann Spring Insert, Ltd., Hamilton, Ont., has been incorporated with capital stock of \$40,000 by George R. Harvey, Cecil V. Langs, Ewart G. Binkley, and others, to manufacture accessories and parts for automobiles, vehicles and machinery.

The foundry owned by the Hull Iron & Steel Co., Ltd., Hull, Que., was damaged by fire with a loss of \$5,000. The plant will be rebuilt immediately.

The British Columbia Metal Trades Association, Victoria, B. C., has been furnished with two sets of plans giving the details of the main engines required for the standard wooden steamers to be built by the Imperial Munition Board. Bids have already been asked by representatives of the Board for 50 winches, and upon the arrival at Victoria of Messrs. Chisholm and Russell, representatives of the Munitions Board, for the purpose of looking into the facilities of British Columbia, it is expected that large orders will be placed in the province.

The new plant of the Dominion Abrasive Wheel Co., at Mimico, Ont., the largest factory of its kind in Canada, has been completed and practically all the machinery has been installed. The plant will manufacture abrasive wheels and stones for grinding and sharpening, at the rate of 150,000 per week. The plant cost, including machinery, \$110,000, and will employ 60 men, also a large amount of female help. E. W. Sawyer is manager of the company.

The Canada Emery Wheels, Ltd., Hamilton, Ont., recently incorporated, is at present operating a large plant at Hamilton.

The Canadian Sprinkler Equipment Co., Toronto, Ont., recently incorporated, reports that it does not intend at present to establish a manufacturing plant in Toronto.

The West Milwaukee locomotive and car shops of the Chicago, Milwaukee & St. Paul Railway Co. have received orders to start the construction of 1500 gondola cars, upon the completion of which work will start on 1000 freight cars. Walter Alexander, general superintendent, has issued a call for 500 men for the metal and woodworking departments to make possible an increase in production from four cars a day to six. The Marsh Refrigerator Service Co., Milwaukee, has taken a contract to build cars for the Milwaukee road and is calling for 200 workmen.

The General Electric Co. is devoting a new building having 20,000 sq. ft. of floor space at its Schenectady works to the manufacture of industrial electric heating devices. The output of the new shop ranges from the smallest heating unit to complete equipments for industrial ovens for core baking, japan baking and for baking and drying miscellaneous materials and complete ovens for sheradizing and air tempering. The shop also produces melting pots for lead and tin alloys and many other devices for applying electric heat in the metals industries.

The Four Wheel Drive Auto Co., Clintonville, Wis., is rushing work on the construction and equipment of a large machine-shop addition, undertaken a short time ago, to enable it to make the earliest possible delivery of 3250 Class B army trucks to the Government, at the rate of 175 trucks per month, beginning Aug. 1. The trucks will be equipped with ordnance towing hooks and the contract price is \$3,248 each.

URGES SALES AGENCY

Sir William Peat Discusses Plans for Extending British Trade

In testifying before the British Board of Trade Committee on Iron and Steel Industries with reference to the establishment of a selling agency and to regulate and control sales of manufactured steel for delivery abroad, Sir William B. Peat described at length methods which other countries adopt to regulate the sale of their products. In the case of the United States, he referred to the activities of the United States Steel Products Co. and to the advantages arising through the organization of this company as a subsidiary of the United States Steel Corporation. He quoted at length from the annual report of the Corporation for 1915 and from Government reports in regard to foreign commerce of the United States. He urged the importance of co-operation between the producers of raw material and those turning out the finished product and advocated the establishment of a sales agency. His testimony was in part as follows:

"If the steel manufacturer in this country has to compete for exports with Germany and the United States he will want every assistance that the trade of the country can give, which would include assistance from the producers of fuel as well as from the manufacturer of raw steel. Such a scheme should be initiated by a meeting of parties interested in the production of raw steel and in the production of fuel and iron ore, to arrange for a rebate from all these sources on material to be exported. This, of course, presupposes that the home markets are assured by adequate protection to British manufacturers; otherwise it is a hopeless proposition because the foreign makers will dump, as they have done in the past.

Needs Government Help

"In my opinion, individual effort will never secure the share of export trade to which British makers are entitled. Where is there a firm big enough to go in for the propaganda necessary to secure foreign trade? Propaganda and representation in foreign buying countries are an absolute necessity, and it must be borne in mind that it should not be propaganda meaning a matter of £200 or £300 a year, but propaganda and representation which will ensure an entrance into the highest quarters in the kingdom where it is desired to do business. If every separate firm was represented abroad, it would not only be extremely wasteful in the matter of expenditure, but it would be ineffective, because the man whom each firm could appoint to represent it abroad could not possibly have the standing of an agency which had behind it the United States Steel Corporation, with nearly £400,000,000 engaged in its business and making \$100,000,000 profit during 1915. There is no firm in this country or any reasonably small combination of firms which could establish an agency with the influence of the agency operated by the German Verband, assisted and encouraged by the German Government.

"Assume the scheme to be voluntary, and I do not suppose there is a possibility of its being other than voluntary at the moment, I think the method by which it is to be done is to arrange for each department of the steel trade, rails, plates, angles, joists, tires, axles, wheels, springs and sheets, to be jointly represented abroad, the cost being paid by the departments concerned. If the Government arranged with its commercial attachés abroad that they were to render every assistance to representatives of a British selling agency, that would be of great assistance to us in the various countries where we desire to sell our products.

"If all the steel and iron associations are prepared to recommend an expenditure on suitable representation abroad, it should not be left to one man to take all the cheap orders for export and to another to do all the nice business at home. The man who takes the home trade must contribute for the general benefit to secure the export orders, by which alone the mills can be kept fully occupied. The equalization of prices for home and export has, in my experience, worked quite satisfactorily and successfully.

"If you are agreed there is a need for a selling agency of this description, the next thing to do is to summon the various trade associations to meet and include with these various associations the fuel and iron ore producers. You could then place the facts before them and see to what extent they are prepared to consider the matter."

Arrangements to reduce railway rates for exports were discussed, and Sir William, continuing, said:

"I do not consider that extensions of existing works can be stopped, and I am not sure that it would be wise to attempt to do so. The principal point would be for the British to increase their sales in the same ratio as their extensions. This has actually occurred with the German Verband, whose members went on increasing their capacity, thereby compelling the organization to find an output for it. If the Germans had not had a Verband, they would not have been able to have extended."

Sir William spoke of the extensions being made in the United States.

In conclusion he said: "It must be remembered that we live more upon exports than the Americans do. The United States has a population of 100,000,000 and their home market is far greater than ours can ever be. British manufacturers cannot exist on home trade alone and we must do our level best to secure our export trade against our competitors. A big expansion of the British steel trade is anticipated and social programs concerning the welfare and comfort of the workpeople will have to go with it. This means a comprehensive effort of a big body of capital.

"In the formation of a selling agency we should have Government support, or, at any rate, the goodwill of the Government, so that the members combining may not be supposed to be engaged in an illegal proceeding. It would be much better if meetings of that character should have the blessing of the Government. It is probably not possible to have legislation in favor of it, but there is a great difference between Government opposition and Government encouragement. I am quite convinced that a selling agency would lead to greater prosperity and would result in a greater benefit to both manufacturers and workmen. No selling agency, however, would be of great value unless our home markets are protected from dumping by foreign manufacturers not depending, like ourselves, upon export work.

"It is essential for the national security that iron and steel should be made in this country."

Government Will Build Many Steel Vessels

(Continued from page 195)

and are bending their energies in preparation. The Pennsylvania Shipbuilding Co. has 14 ships under construction, mostly for the Cunard Steamship Co., at its plant at Gloucester City, N. J., and the plant of the New Jersey Shipbuilding Co. on an adjoining site is being equipped with the expectation that the first keels for steel ships will be laid about Nov. 1. The first launching at the yard of the Pennsylvania Shipbuilding Co. will take place in about two weeks. This will be a 7000-ton tanker. Six tankers of this capacity are being built and eight 12,500-ton cargo boats. At the Pusey & Jones plant at Wilmington, Del., several wooden freight steamers, motor schooners and two dredges are being constructed. This plant also has a contract to build three mine-sweeping tugs for the U. S. Government.

The Harlan & Hollinsworth plant at Wilmington, Del., is building 13 merchant vessels of 10,000 tons capacity and has a contract to build three mine sweepers for the U. S. Government. It is said that this plant has extensive enlargements in contemplation, but whether these plans will be carried out depends upon the action of the Emergency Fleet Corporation.

Other smaller plants along the Delaware River include the Jackson & Sharp plant at Wilmington, which is building wooden vessels, and the John H. Mathis Shipbuilding Co. at Camden, N. J., which is building a number of submarine chasers for the Navy.

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